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Vol. 973 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

August 8, 1978

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

August 8, 1978 Volume 973 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

May 2, 1978. LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Filing of PCT or EPC Format Applications in Canada

The following notice, which appeared in the July 4, 1978 issue of the Canadian Patent Office Gazette has been forwarded to the Patent and Trademark Office and is being republished for the information of United States applicants and representatives who may wish to file in Canada. The Canadian notice reads as follows:

"Filing of PCT or EPC Applications in Canada

The Canadian Patent Office will accept all disclosures, claims and drawings prepared in the formats required under the Patent Cooperation Treaty (PCT) or the European Patent Convention (EPC) in respect of Canadian applications for patents.

In particular, the margins called for under the PCT or EPC, while not in conformity with the Canadian Rules, will be accepted for filing and considered sufficient to complete applications. Pages of specifications and drawings may be of a size A4 or 8 x 13 inches so long as the full set of papers in a single application are consistent. The spacing between typed lines may be either double or one and one-half spaces.

J. A. BROWN,
Director, Patents Branch"

July 17, 1978. DONALD W. BANNER,
Commissioner of Patents and Trademarks.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,010,245, F. R. Conibear, TRAPS, **filed** Apr. 12, 1977, D.C.N.J. (Newark), Doc. 77–0692, *Woodstream Corporation* v. *Wilderness Corp.*

3,134,718, A. Nobile, PREGNA–1,4-DIENES AND COMPOSITIONS CONTAINING SAME, **filed** Mar. 15, 1978, D.C. Md. (Baltimore), Doc. Y–78–434, *Schering Corporation* v. *D-M Pharmaceuticals, Inc.*

3,290,841, M. A. Santore, APPARATUS FOR NETTING MEAT AND MEAT PRODUCTS; **3,477,860** same, METHOD FOR NETTING MEAT, **filed** Mar. 10, 1978, D.C.N.J. (Newark), Doc. 78–475, *Jetnet Corporation* v. *Bendler Knitting Corp.*

3,304,565, H. Fuhring, CLEANING INSTALLATIONS FOR VEHICLES, **filed** Jan. 7, 1975, D.C., N.D., Ill. (Chicago), Doc. 75c64, *The Allen Group, Inc.* v. *Nu-Star, Inc.* Filed Finding of Fact and Conclusions of Law. Enter judgment order. Order judgment on the complaint is entered for the defendant Nu-Star, Inc. Judgment on the counterclaim is entered for the defendant, Nu-Star, Inc., on June 14, 1977.

3,375,800, Cole and Buller, SEISMIC CABLE DEPTH CONTROL APPARATUS, **filed** July 25, 1975, D.C., S.D. Tex. (Houston), Doc. CA75–H–1288, *Continental Oil Company* v. *Jimmy R. Cole, doing business as Jim R. Cole & Associates and Cole Development Company, Inc.* Judgment for the defendant, July 25, 1975.

3,377,888, J. B. Sponsler, EXTENSION DEVICE FOR HAND DRILL, **filed** Mar. 22, 1978, D.C. Minn. (Minneapolis), Doc. 4–78–C 16, *John B. Sponsler* v. *Milwaukee Electric Tool Corporation.*

3,396,342, A. E. Feinberg, POWER SUPPLY CIRCUIT FOR CONTINUOUS WAVE MAGNETRON OPERATED BY PULSED DIRECT CURRENT, **filed** Jan. 14, 1977, D.C., E.D. Ill. (Chicago), Doc. 77c145, *Advance Transformer Co.* v. *Magic Chef, Inc.* Agreed order of dismissal, Feb. 10, 1977.

3,434,209, B. Weissman, METHOD FOR BUILDING SUPERSTRUCTURES ON DENTITION, **filed** Mar. 20, 1978, D.C., E.D. Pa. (Philadelphia), Doc. 78–904, *Ipco Hospital Supply Corporation* v. *Lee Fils d'Auguste Maillefer S.A., Star Dental Mfg. Co.*

3,442,623, P. E. Aegidius, METHOD OF DETERMINING THE FAT CONTENT OF MIIK AND RELATED PRODUCTS, **filed** Feb. 16, 1978, D.C., S.D.N.Y., Doc. 78–C–712 RLC, *A/S Foss Electric* v. *American Metering Systems, Inc.*

3,471,011, Iannicelli, Millman and Stone, PROCESS FOR IMPROVING THE BRIGHTNESS OF CLAYS, **filed** Jan. 27, 1977, D.C.N.J. (Newark), Doc. C–77–173, *Engelhard Minerals and Chemicals Corp.* v. *J. M. Huber Corp.*

3,477,860. (See 3,290,841.)

3,625,793, Sheridan and Jackson, BALLOON-TYPE CATHERERS AND METHOD OF MANUFACTURE, **filed** May 16, 1977, D.C. Del. (Wilmington), Doc. 77–178, *Mallinckrodt, Inc.* v. *Brunswick Corp. and Sherwood Medical Industries, Inc.*

3,792,133, R. R. Goughnour, METHOD FOR SLIP-FORMINGWALLS OF ASYMMETRICAL TRANSVERSE CROSS SECTION; **3,957,405,** same, SLIP FORM HAVING HINGED GATE MEANS; **4,014,633,** same, ADJUSTABLE SLIP FORM, **filed** Jan. 16, 1978, D.C., N.D. Ga. (Atlanta), Doc. C78–76A, *Gomaco Corporation* v. *A. C. Aukerman Co.*

3,957,405. (See 3,792,133.)

4,014,633. (See 3,792,133.)

D. 240,084, M. C. Melchior, BATHING POOL; **D. 245,541,** same; **D. 245,542,** same, **filed** Jan. 27, 1978, D.C., C.D. Calif. (Los Angeles), Doc. CV78–398–RF, *Hydro-Spa, Inc.* v. *Walter Swuyres.*

D. 245,541. (See D. 240,084.)

D. 245,542. (See D. 240,084.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,169,295, Re. S.N. 913,374, Filed Jun. 7, 1978, Cl. 432/259, PRECISION TILE SETTER, Stanley F. Paspy, Owner of Record: *Ferro Corporation, Cleveland, Ohio,* Attorney or Agent: Milton L. Simmons, Ex. Gp.: 344

3,806,192, Re. S.N. 912,233, Filed Jun. 2, 1978, Cl. 297/318, CHAIR FOR DENTAL PATIENTS, Wilhelm Ohlrogge, et al., Owner of Record: *Siemens Aktiengesellschaft, Erlangen, Germany,* Attorney or Agent: Benjamin H. Sherman, et al., Ex. Gp.: 355

3,962,780, Re. S.N. 912,343, Filed Jun. 5, 1978, Cl. 29/596, METHODS AND APPARATUS FOR MAKING ELECTRICAL INTERCONNECTIONS, Alan L. Kindig, Owner of Record: *General Electric Company, Fort Wayne, Ind.,* Attorney or Agent: John M. Stoudt, et al., Ex. Gp.: 321

3,968,056, Re. S.N. 913,433, Filed Jun. 7, 1978, Cl. 252/514, RADIATION CURABLE INKS, Donald A. Bolon, et al., Owner of Record: *General Electric Company, Schenectady, N.Y.,* Attorney or Agent: John F. McDevitt, et al., Ex. Gp.: 223

4,032,523, Re. S.N. 912,947, Filed Jun. 5, 1978, Cl. 260/256.4 N, 4-AMINO OR (HYDRAZINO)-2-(PYRIDINYL) PYRIMIDINES, George Y. Lesher, et al., Owner of Record: *Sterling Drug Inc., New York, N.Y.,* Attorney or Agent: B. Woodrow Wyatt, et al., Ex. Gp.: 122

4,070,583, Re. S.N. 913,432, Filed Jun. 7, 1978, Cl. 250/483, RARE EARTH OXYHALIDE PHOSPHORS COACTIVATED WITH TERBIUM, THULIUM, Jacob G. Rabatin, Owner of Record: *General Electric Company, Schenectady, N.Y.,* Attorney or Agent: John F. McDevitt, et al., Ex. Gp.: 256

PATENT NOTICES

Certificates of Correction for the Week of Aug. 8, 1978

Re. 29,598	4,058,840	4,072,819	4,079,904
D. 237,597	4,059,396	4,073,482	4,080,265
3,009,855	4,059,605	4,073,817	4,080,282
3,808,888	4,059,653	4,074,569	4,080,372
3,868,941	4,060,489	4,074,874	4,080,459
3,955,007	4,060,979	4,074,992	4,080,469
3,957,165	4,061,026	4,075,065	4,080,641
3,960,563	4,061,620	4,075,097	4,080,792
3,974,875	4,061,663	4,075,120	4,080,820
3,982,691	4,061,898	4,075,218	4,080,821
4,019,911	4,062,367	4,075,240	4,080,837
4,020,798	4,062,898	4,075,287	4,080,918
4,021,232	4,062,990	4,075,443	4,080,951
4,025,517	4,064,143	4,075,711	4,081,157
4,027,448	4,064,309	4,076,218	4,081,238
4,035,647	4,065,418	4,076,236	4,081,245
4,038,326	4,065,559	4,076,665	4,081,280
4,038,592	4,065,868	4,076,924	4,081,330
4,039,323	4,066,235	4,077,280	4,081,341
4,041,061	4,066,400	4,077,315	4,081,343
4,041,220	4,066,639	4,077,383	4,081,388
4,042,032	4,067,335	4,077,468	4,081,502
4,042,596	4,067,371	4,077,557	4,081,515
4,043,972	4,067,605	4,077,730	4,081,521
4,043,975	4,067,780	4,077,750	4,081,523
4,048,135	4,067,946	4,077,899	4,081,604
4,048,620	4,067,968	4,078,044	4,081,605
4,048,987	4,068,035	4,078,066	4,082,022
4,049,748	4,068,038	4,078,130	4,082,195
4,049,830	4,069,109	4,078,675	4,082,527
4,050,432	4,069,277	4,078,731	4,082,881
4,050,900	4,069,924	4,078,766	4,083,076
4,051,129	4,070,136	4,078,790	4,083,135
4,052,395	4,070,171	4,078,978	4,083,554
4,052,398	4,070,185	4,078,984	4,083,710
4,052,554	4,070,313	4,078,987	4,084,509
4,053,603	4,070,521	4,079,212	4,085,227
4,056,272	4,070,524	4,079,223	4,085,247
4,056,514	4,070,784	4,079,260	4,086,419
4,056,541	4,071,389	4,079,278	
4,058,484	4,072,306	4,079,354	
4,058,543	4,072,668	4,079,900	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,655,721, U. Arni, A. Faucci and A. Stocker, PROCESS FOR THE PRODUCTION OF MALONIC ACID DINITRILE AND PURIFICATION THEREOF, Interference No. 99,456, decided Mar. 10, 1978, claims 1 and 2.

Patent No. 3,766,508, T. Wada and Y. Shindo, FLAME-PROOF COATED RESISTORS, Interference No. 99,033, decided Mar. 31, 1978, claim 2.

Patent No. 3,770,928, W. P. Kornrumpf and J. D. Harnden, Jr., RELIABLE SOLID STATE INDUCTION COOKING APPLIANCE WITH CONTROL LOGIC, Interference No. 98,982, decided Apr. 13, 1978, claims 1, 8 and 10.

Patent No. 3,781,272, G. R. Flouret, TRIPEPTIDE, Interference No. 98,942, decided Jan. 31, 1978, claim 8.

Patent No. 3,799,863, R. A. Zeineh, ELECTROPHORESIS AND ELECTROFOCUSING APPARATUS, Interference No. 99,411, decided Mar. 17, 1978, claims 1, 2, 3 and 7.

Patent No. 3,827,489, H. E. McGowen, Jr., APPARATUS FOR INSTALLING AND REMOVING FLOW VALVES, Interference No. 99,092, decided Apr. 24, 1978, claims 2 and 3.

Patent No. 3,837,985, V. A. Chase, MULTI-DIRECTIONAL REINFORCED COMPOSITE AND METHOD OF MAKING THE SAME, Interference No. 99,654, decided Mar. 7, 1978, claims 9 and 15.

Patent No. 3,865,760, F. Pitts and M. H. Clubley, FLAME RETARDANT MATERIALS, Interference No. 99,548, decided Apr. 10, 1978, claims 1–4 and 7–10.

Patent No. 3,882,236, B. B. Molloy, PHARMACEUTICAL COMPOSITIONS CONTAINING SUBSTITUTED 2–OXO-INDOLINES AND THE USE THEREOF TO TREAT ANXIETY AND TENSION, Interference No. 99,425, decided Mar. 17, 1978, claims 5 and 6.

Patent No. 3,890,742, F. N. Ladd and D. G. Stacy, WINDOW REGULATOR MECHANISM, Interference No. 99,303, decided Mar. 9, 1978, claims 3 and 5.

Patent No. 3,924,111, C. R. Farris, ELECTRONIC CALCULATORS FOR NAVIGATIONAL PURPOSES, Interference No. 99,455, decided Mar. 30, 1978, claims 1, 11, 12 and 13.

Disclaimer

3,982,515.—*Cyril E. Bradshaw,* Kalamazoo, Mich. EXHAUST GAS RECIRCULATION CONTROL ASSEMBLY. Patent dated Sept. 28, 1976. Disclaimer filed June 13, 1978, by the assignee, *Eaton Corporation.*

Hereby enters this disclaimer to claims 1 through 5 of said patent.

Patents Available for Licensing or Sale

3,680,237. OUT-DOOR ILLUMINATED SIGN. John G. Finnerty, 251 De Grand Ave., Teaneck, N.J. 07666.

3,701,395. RESCUE AND SAFETY VEST. Stuart J. Theobald, 3206 Paul Drive, Wheaton, Md. 20902.

4,064,880. SANITARY TUBULAR NAPKIN FOR MALES. Dexter J. Logan, P.O. Box 1012, West Covina, Calif. 91793.

4,076,201. ADJUSTABLE CHAIR SPINDLE ASSEMBLY. Walter E. Hudnall, 2157 W. 236th Place, Torrance, Calif. 90501.

4,083,421. TWO SPEED MOTORCYCLE HUB TRANSMISSION. Ronald L. Van Horn, Donald R. Van Horn, and Roy B. Van Horn, 3003 Beverly Drive, Pittsburg, Calif. 94565.

The following two patents are offered by John O. Richards, 980 Mill Circle, Apt. #99, Alliance, Ohio 44601.

3,835,507. ROPE HOLDING DEVICE.

3,578,840. REVOLVING REFLECTOR.

The General Electric Company is prepared to grant nonexclusive licenses under the following 5 patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to the General Electric Company, Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

4,002,112. COOKING APPLIANCE WITH REMOVABLE COOKING GRIDS.

4,039,777. HEATING APPARATUS FOR GLASS OR CERAMIC COOKING VESSEL.

4,056,050. COFFEEMAKER WITH BREW STRENGTH CONTROL.

D. 239,994. ELECTRIC SHAVE CREAM DISPENSER OR SIMILAR ARTICLE.

D. 241,601. DESIGN FOR COMBINED SKILLET AND CHAFING DISH OR THE LIKE.

Applications for license may be addressed to: Patent Counsel, General Electric Company, 101 East Carmel Drive, Suite 205, Carmel, Ind. 46032.

3,077,530. COOKING APPLIANCE.

3,568,935. HINGED SPRAY PLATE AND BOX FOR DISHWASHERS.

3,585,128. PRE-WASH SCRAP BASKET FOR DISHWASHER.

3,612,253. RECESSED CHAIN-TRACK ASSEMBLY FOR DISHWASHERS.

3,720,155. FRYING APPARATUS WITH REMOTE CONTROL THERMOSTAT.

3,949,772. DOOR TYPE DISHWASHER.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents & Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St. S.W., Washington, D.C. 20324

Patent application 801,453. Synthesis of Fluorotrinitromethane. Filed May 26, 1977.

Patent application 856,385. Fluorocarbon Bis(o-Aminophenol) Compounds, Containing a Hydrocarbon Moiety. Filed Dec. 1, 1977.

Patent 4,074,523. Pressure Actuated Collapsible Curtain Liners for a Gas Turbine Engine Nozzle. Filed Dec. 8, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,074,527. Self-Contained Power Subsystem. Filed Apr. 9, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,074,859. Deformable Plug for an Aircraft Engine Exhaust Nozzle. Filed Nov. 10, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,075,073. Method for the Preparation of Bis(Perfluoro-t Butyl) Peroxide. Filed Feb. 23, 1977. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,075,246. 1,3-Bis(2,2,2-Fluorodinitroethoxy)-2,2-Bis (difluoramino) Propane. Filed Oct. 29, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,076,418. Film Slewing Device for Drum Type Contact Printer. Filed Apr. 5, 1976. Patented Feb. 28, 1978. Not available NTIS.

Patent 4,076,454. Vortex Generators in Axial Flow Compressor. Filed June 25, 1976. Patented Feb. 28, 1978. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 4,064,025. Separation of Carbon and Nitrogen Isotopes by Selective Photodissociation Azo or Diazo Compounds. Filed Feb. 24, 1976. Patented Dec. 20, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts. NW.,
Washington, D.C. 20240

Patent 4,053,775. Constant Flow Radon Gas Monitor. Filed Jan. 29, 1976. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,053,776. Sub-Micron Particle Detector. Filed May 25, 1976. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,055,051. Unitary Drill Bit and Roof Bolt. Filed Jan. 8, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,057,115. Flexible Shaft for a Roof Drill. Filed May 7, 1976. Patented Nov. 8, 1977. Not available NTIS.

Patent 4,057,478. Electrochemical Gas Monitor. Filed Feb. 5, 1976. Patented Nov. 8, 1977. Not available NTIS.

Patent 4,058,668. Cold Crucible. Filed Mar. 1, 1976. Patented Nov. 15, 1977. Not available NTIS.

Patent 4,062,412. Flexible Shaft Drilling System. Filed Jan. 29, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,062,595. Automatic Face Transfer Linear Cutting Rotary Head Continuous Mining Machine and Method. Filed Oct. 15, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,074,778. Square Hole Drill. Filed July 14, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,074,779. Backwashing System for Slurry Pick-Up Used in Hydraulic Borehole Mining Devices. Filed May 9, 1977. Patented Feb. 21, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—
Code 302, Arlington, Va. 22217

Patent application 840,189. Oil Level Indicator for Use With Damping Fluid Metering Pins. Filed Oct. 6, 1977.

Patent application 851,022. Digital Plotting System for Displaying Straight Line Information. Filed Nov. 11, 1977.

Patent application 851,086. Digital Plotting System for Displaying Character Information. Filed Nov. 11, 1977.

Patent application 864,286. Digital Plotting System for Graphic Information. Filed Dec. 20, 1977.

Patent Application 865,076. Digital Plotting System for Displaying Curved Line Information. Filed Dec. 20, 1977.

Patent application 880,514. Silicon-Phthalocyanine-Siloxane Polymers. Filed Feb. 23, 1978.

Patent application 880,515. Silicon-Phthalocyanine-Siloxy Monomers. Filed Feb. 23, 1978.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 15, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-6-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-18-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-13-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-3-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	10-14-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-23-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-9-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-19-77

Expiration of patents: The patents within the range of numbers indicated below expire during July 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,990,549 to 2,994,086, inclusive
Plant Patents..... Numbers 2,067 to 2,075, inclusive

REISSUES

AUGUST 8, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,720
TIME CORRECTING APPARATUS FOR AN ELECTRONIC TIMEPIECE

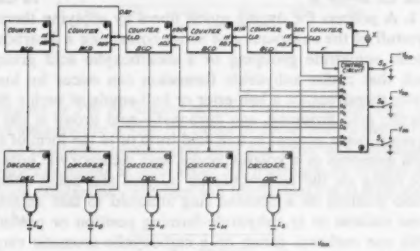
Kinji Fujita, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Original No. 3,810,356, dated May 14, 1974, Ser. No. 351,943, Apr. 17, 1973. Application for reissue May 14, 1976, Ser. No. 686,426

Claims priority, application Japan, Apr. 17, 1972, 47-38529

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 R **12 Claims**



1. In an electronic timepiece having multi-stage divider timekeeping circuit means and multi-digit display means coupled to said corresponding [multi-stage] dividers *of said timekeeping circuit means* for the digital display of time, the improvement which comprises time correcting circuit means, a manually operable selecting switch means and a manually operable correcting switch means coupled to said time correcting circuit means, said time correcting circuit means being operatively coupled to the dividers of said timekeeping circuit means associated with [the digits] *each digit* of time of said display means to be corrected for [the] [selective sequential selection of] *selectively sequentially selecting* each digit of time *to be corrected* for correction by the manual operation of said selecting switch *means* and for the selective correction of [said] *a* selected digit of time by the manual operation of said correcting switch *means*, said time correction circuit means being further coupled to *at least* each digit of time of said display means *to be corrected* and adapted to dispose [the] *each* selected [digits] *digit* of time of said digital display means *to be corrected* so as to render same *visually* distinguishable from the other digits of said display means.

Re. 29,721
PLASTIC BAG AND A PROTECTIVE CONTAINER THEREFOR AND A FIXTURE FOR SECURING THE BAG IN THE CONTAINER

Luigi Ukmar; Mario Agostini, and Gianfranco Bellandi, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

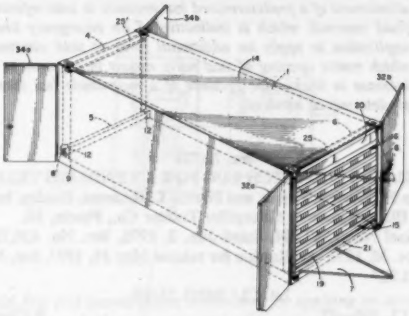
Original No. 3,904,084, dated Sep. 9, 1975, Ser. No. 397,417, Sep. 14, 1973. Application for reissue Sep. 6, 1977, Ser. No. 830,900

Claims priority, application Italy, Sep. 20, 1972, 29432 A/72

Int. Cl.[2] B65D *33/14*

U.S. Cl. 222—105 **9 Claims**

9. A large plastic bag adapted to contain granular material while disposed in a protective container having a floor and at least one port for charging and discharging said granular material; said bag being closed by weld lines and folded to form a pair of oppositely disposed triangularly shaped integral flaps projecting outwardly; means for anchoring a first flap to the floor of the container comprising a channel member having a flap wound thereabout and means for pressing the wound flap against said channel member; means carried by said container for securing the channel member and said flap pressed thereagainst to the floor of the container; a second flap in the same plane as the first flap and adapted for emptying the bag; means for securing the second flap to the floor of the container adjacent to said port of the container while the bag is being loaded and is storing bulk material; a third



flap on the same end of the bag as the emptying flap; a series of elements arranged to form a grating in the container convering said port and providing with a clearance through which loading and unloading flaps project; a cross-bar inserted above the grating for retaining the flap used for loading the bag; and means comprising a hopper secured to the unloading flap for unloading the contents of the bag when the port is open.

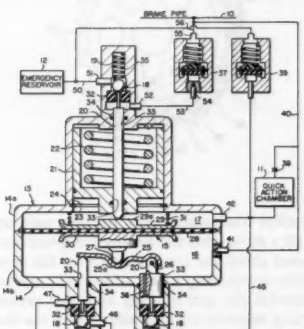
Re. 29,722
FLUID BRAKE CONTROL SYSTEM

Eugene Douglas McEathron, Watertown, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Original No. 3,966,269, dated Jun. 29, 1976, Ser. No. 612,840, Sep. 12, 1975. Application for reissue May 13, 1977, Ser. No. 796,784

Int. Cl.[2] B60T *15/30*

U.S. Cl. 303—37 **29 Claims**



29. Fluid brake control apparatus for a railway car having a

brake control pipe, a reference fluid reservoir which is at times charged from the brake pipe, an emergency fluid reservoir, and an accelerated release control device comprising:

a. a housing having a fluid pressure differential operated abutment subject to actuation by differences in pressure between respective brake pipe and reference fluid pressure chambers acting on opposite sides of said abutment,

b. valve means of the poppet type having relatively movable seat and closure elements at least one of which is operatively connected to said abutment,

c. fluid supply means responsive to the opening of said valve means by movement of said abutment in response to an increase in brake pipe pressure to permit fluid to flow from said emergency reservoir to the brake pipe,

d. and further means being rendered active in response to the attainment of a predetermined low pressure in said reference fluid reservoir which is indicative of an emergency brake application to apply an additional force to said abutment which resists opening of said valve means in response to an increase in brake pipe pressure of a magnitude less than a predetermined amount.

Re. 29,723

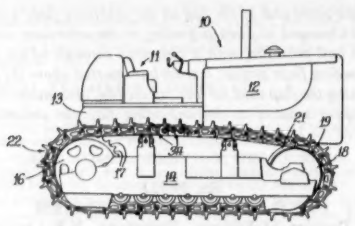
RESILIENT MID-PITCH LUG FOR AN ENDLESS TRACK

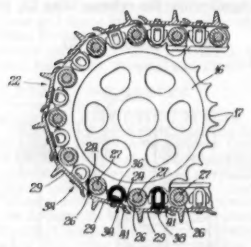
Glenn M. Haslett, Peoria, and Harold L. Reinsma, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Original No. 3,887,244, dated Jun. 3, 1975, Ser. No. 420,720, Nov. 30, 1973. Application for reissue May 31, 1977, Ser. No. 801,717

Int. Cl.[2] B62D *55/08*

U.S. Cl. 305—57 **8 Claims**





1. In an endless track assembly of the type used on a vehicle provided with a drive sprocket having teeth and notches alternately disposed about the circumference of the sprocket, said track assembly comprising a pair of laterally upstanding link elements; parallel pin and bushing elements secured to and interconnecting respectively opposite ends of the links; a track shoe secured to the bottoms of said links; the improvement comprising a resilient impact lug reinforced by reinforcing means including a wear resistant material secured to the contact end of said impact lug, said lug being releasably secured to the shoe midway between the bushing elements, said impact lug having a topmost portion of greater height from the track shoe than the topmost portion of the adjacent bushings whereby initial contact is made by said lug so that impact energy is absorbed by the lug prior to engagement of an adjacent bushing.

Re. 29,724

DYEING PROCESS

Colin William Greenhalgh; David Francis Newton; Dennis Eckersley; Ian Cheetham; Duncan Adrian Sidney Phillips; Kenneth Dunkerley; Gerald Williams, and Vibhas Chokshi, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Original No. 3,953,162, dated Apr. 27, 1976, Ser. No. 453,632, Mar. 21, 1974. Application for reissue Mar. 8, 1977, Ser. No. 775,516

Claims priority, application United Kingdom, Apr. 25, 1973, 19580/73; Oct. 16, 1973, 48080/73

Int. Cl.[2] D06P *1/20*; C09B *1/00*

U.S. Cl. 8—39 B **10 Claims**

1. A process for dyeing nylon fibers by applying thereto a dyestuff of the anthraquinone series containing a dicarboxylic cyclic anhydride grouping or a dicarboxylic acid grouping such that cyclic anhydride formation can occur by loss of water therefrom, or a half-ester or half-amide of such a dicarboxylic acid grouping, any carboxylic acid group in the said dyestuff being present in free acid form or in the form of a salt with ammonia or a volatile amine, said dicarboxylic grouping not being on the anthraquinone nucleus and being either in ortho position on a benzene ring attached to said anthraquinone nucleus or in anhydride-forming position or positioned with one carboxyl group on a carbocyclic aromatic ring attached to said anthraquinone nucleus and the other in anhydride-forming position therewith on an alkyl side chain, and heating the nylon fiber until fixation of the dyestuff takes place.

Re. 29,725

ANALYTICAL TEST PACK AND PROCESS FOR ANALYSIS

Donald R. Johnson, Wilmington; Richard G. Nadeau; Gerrit Nieuweboer, both of Claymont, all of Del., and William L. Truett, Blackwood, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Original No. 3,476,515, dated Nov. 4, 1969, Ser. No. 545,494, Apr. 26, 1966. Application for reissue May 7, 1970, Ser. No. 35,438

Int. Cl.[2] G01N *33/16, 21/24*

U.S. Cl. 23—230 R **35 Claims**

19. A method of analyzing a test sample comprising: providing an analytic test pack having a reaction chamber, at least one wall of which is of pliable material, and at least one reagent compartment containing reagents and separated from said reaction chamber; introducing the test sample into said reaction chamber; releasing at least one reagent contained in at least one reagent compartment into said reaction chamber, independently of any other reagents in other reagent compartments, whereby any single reagent or combination of reagents may be introduced into said reaction chamber; mixing said test sample and said reagent; and reading out the result of the reaction between said reagent and said test sample.

Re. 29,726

METHOD OF COATING CARBON STEEL

Fred Byrd, Lebanon; Marvin B. Pierson, Franklin; Thomas A. Compton, Middletown, and Frank C. Dunbar, Monroe, all of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

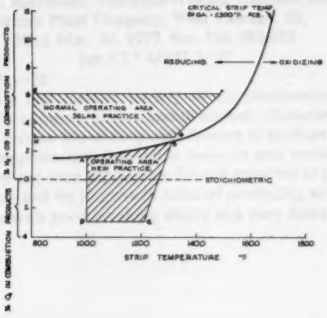
Original No. 3,936,543, dated Feb. 3, 1976, Ser. No. 499,772, Aug. 22, 1974. Application for reissue Feb. 14, 1977, Ser. No. 768,111

Int. Cl.[2] C23C *1/00*

U.S. Cl. 427—320 **7 Claims**

1. A method of preparing carbon steel strip and sheet for

fluxless hot dip metallic coating, comprising the steps of heating said strip and sheet in a furnace heated by direct combustion of fuel and air therein and [in an atmosphere containing from about 3% by volume oxygen to about 2% by volume excess combustibles in the form of hydrogen and carbon monoxide] *operated at fuel air ratios ranging from stoichiometrically*



equivalent to 3% by volume oxygen, controlling the strip and sheet temperature within the range of about 540° to about 705° C, and thereafter heating said strip and sheet in a subsequent furnace containing at least about 5% hydrogen by volume and balance substantially nitrogen to a temperature of at least about 675° C.

Re. 29,727

DIGITAL DISPLAY DEVICE

Kinji Fujita, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

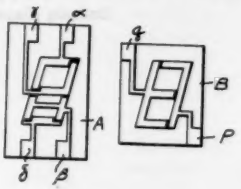
Original No. 3,781,863, dated Dec. 25, 1973, Ser. No. 209,986, Dec. 20, 1971. Application for reissue Nov. 3, 1975, Ser. No. 628,010

Claims priority, application Japan, Dec. 23, 1970, 45-116254

Int. Cl.[2] **G02F** *1/13;* **G09F** *9/32*

U.S. Cl. 340—336 **12 Claims**

7. A digital display device comprising a non-conductive first plate having thereon at least one group of seven conductive segments essentially in the conventional figure-8 arrangement, wherein selected segments of said group are electrically connected together to form sub-groups whereby all of the segments in a sub-group may be actuated together; a non-conductive second plate opposed to and spaced from said first plate and having thereon at least one conductive segmented group in figure-8 arrangement, each group on said second plate being in registry with a group on said first plate and being subdivided into sub-groups of segments, all of the segments in a sub-group being electrically connected; a material positioned intermediate said first and second plates and adapted so that regions thereof in registration with said conductive segments are displayed when an activating voltage pulse is simultaneously applied to opposed conductive segments on



said first and second plates; and means for applying an activating voltage in pulsed sequence to each of the sub-groups in one group on said first plate at a repetition rate sufficiently great that digits, when displayed, appear to be continuously displayed, and for applying an activating voltage pulse to selected sub-groups of the group on said second plate, the group on said second plate being in registry with said one group on said first plate, said pulsing means being adapted to supply pulses to selected subgroups on said second plate in synchronization with said pulsed sequence applied to said one group on said first plate so as to display any selected digit for the period during which said pulsed voltage sequence is applied to said one group on said first plate, at least one of said plates and the conductive segments on said one plate being transparent.

PLANT PATENTS

GRANTED AUGUST 8, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,289

CHRYSANTHEMUM PLANT NAMED LOYALTY

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Mar. 30, 1977, Ser. No. 783,013
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—76 1 Claim

1. A new and distinct variety of chrysanthemum plant, substantially as herein shown and described, characterized by its profuse production of deep pink flowers of medium to large size and composite and decorative form, its year around flowering ability and very dependable 9-week response to photoperiod control, and by its growth habit of producing strong and erect stems with good breaking ability and very dense foliage.

4,290

CHRYSANTHEMUM NAMED BRITISH GOLD

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Mar. 30, 1977, Ser. No. 783,012
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—78 1 Claim

1. A new and distinctive chrysanthemum plant, substantially as herein shown and described, characterized by the golden bronze coloring of its medium size flowers the form of which does not reflex, the medium to tall vigor of the plant growth, and its spreading pot plant habit with a very good breaking ability when manually pinched.

PATENTS

GRANTED AUG. 8, 1978

ERRATA

For CLASS	See PATENT NO.
052–090 R	4,104,868
073–081	4,104,901
123–179 S	4,104,927
400–556.2	4,105,106
297–045	4,105,244
297–149	4,105,247
521–100	4,105,594
521–159	4,105,595
521–056	4,105,596
521–159	4,105,597
521–053	4,105,598
521–131	4,105,599
521–129	4,105,600
521–095	4,105,601
521–062	4,105,616
528–176	4,105,633
526–065	4,105,634
528–126	4,105,635
528–126	4,105,636
528–241	4,105,637
528–130	4,105,638
528–177	4,105,639
528–292	4,105,640
526–071	4,105,641
528–051	4,105,642
528–051	4,105,643
528–314	4,105,644
528–313	4,105,645
528–311	4,105,646
526–033	4,105,647
526–204	4,105,648
526–271	4,105,649
544–405	4,105,661
544–294	4,105,662
544–379	4,105,663
544–378	4,105,664
568–744	4,105,698
568–744	4,105,699
568–875	4,105,700
429–152	4,105,810
235–092 SB	4,105,914
250–199	4,105,915
250–282	4,105,916
250–291	4,105,917

250–337	4,105,918
250–341	4,105,919
250–402	4,105,920
250–423 P	4,105,921
250–445 T	4,105,922
250–456	4,105,923
250–492 A	4,105,924
250–561	4,105,925
250–566	4,105,926
318–676	4,105,961
320–032	4,105,962
322–048	4,105,963
323–043.5 S	4,105,964
324–028 CB	4,105,965
324–113	4,105,966
324–115	4,105,967
324–133	4,105,968
324–151 R	4,105,969
324–158 P	4,105,970
324–203	4,105,971
324–220	4,105,972
325–004	4,105,973
325–021	4,105,974
325–320	4,105,975
325–404	4,105,976
325–472	4,105,977
328–058	4,105,978
328–164	4,105,979
328–165	4,105,980
329–050	4,105,981
200–061.17	4,106,004
336–185	4,106,118

PATENTS

GRANTED AUGUST 8, 1978

GENERAL AND MECHANICAL

4,104,739
HOOK-ON NECKTIE CONVERSION KIT
John P. Burger, Mitchell, Ind., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Apr. 6, 1977, Ser. No. 784,972
Int. Cl.[2] A41D *25/16*
U.S. Cl. 2—155 **1 Claim**

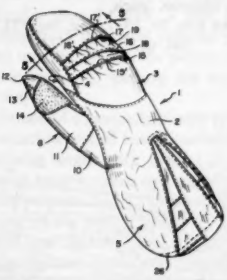
1. A kit for preforming a conventional necktie to a pre-knotted necktie, comprising

a pair of flexible fastener units, each of which is formed of a flat section of flexible material of U-shape in cross-section, with an adhesive coating mounted as a backing to the opposed undersurfaces of the material, with each fastener of a size to fit about the end section of a cut neck strap section of a conventional necktie, with

said fastener units each fitted with one half of a mating detachable fastener assembly, together with

a flat strip of flexible material, coated on both surfaces with adhesive material of a size to fit between two layers of a necktie knot so as to hold the knot fixed when the said two layers are each bonded to a surface of the strip by means of the said adhesive material.

4,104,740
MITTEN CONSTRUCTION
Dixie L. Rinehart, Aspen, Colo., assignor to Comfort Products, Inc., Aspen, Colo.
Filed Oct. 1, 1976, Ser. No. 728,876
Int. Cl.[2] A41D *19/00*
U.S. Cl. 2—158 **1 Claim**



1. A glove constructed in the form of a mitten which comprises in combination:

(A) a shell covering having a back portion, a palm portion, a gauntlet portion and a thumb portion;

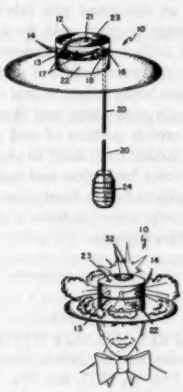
(B) said back portion having a plurality of pleated joints extending across the width of the back portion;

(C) said pleated joints being formed by folding the covering and stitching the folds across the back portion in the area of finger bends of a glove wearer;

(D) an inner lining of pile-like material fixedly secured to an inner surface of said shell and configured in the form of a fingered glove having finger portions defining finger receiving pockets extending forwardly to a seam connecting the back portion and the palm portion, and

(E) said outer shell having a square front end construction at said seam.

4,104,741
NOVELTY HAT DEVICE
Lamont Shaw, 735 Cummins Hwy., Mattapan, Mass. 02126, and Aaron O. Waire, 1066 Ellicott St., Buffalo, N.Y. 14209
Filed Apr. 15, 1977, Ser. No. 787,979
Int. Cl.[2] A42B *1/24*
U.S. Cl. 2—185 R **3 Claims**



1. A novelty amusement device to be placed on the user's head comprising:

a hat having defined therein a head receiving area;

a balloon compartment positioned at the top of said hat above said head receiving area having defined therein a plurality of vent apertures around its outer circumference;

a baffle member forming the base of and separating said balloon compartment from said head receiving area and further having a tube receiving aperture defined therein;

a tube having a first and second end, said second end passing into said head receiving area and through said tube receiving aperture;

a manually operated air pump affixed to the first end of said tube;

a balloon removably affixed to the second end of said tube and positioned within said balloon compartment, said balloon being of a size to expand fully on inflation within the limits of the volume size of said balloon compartment and adapted to burst upon further inflation; and

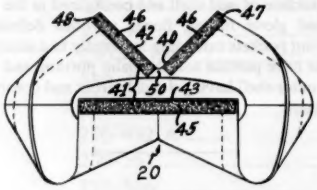
a powder-like substance located within said balloon compartment adapted to be blown out of said vent apertures upon the bursting of said balloon after its inflation by said manually operated air pump, said balloon compartment further having defined therein a balloon entry aperture through which burst balloons can be removed and new balloons and powder inserted.

4,104,742

CONVERTIBLE GARMENT

Sarah E. Rahaim, 3300 Atlantic Blvd., Jacksonville, Fla. 32207

Filed Jan. 13, 1977, Ser. No. 758,929
Int. Cl.[2] A41D 1/14
U.S. Cl. 2—213 6 Claims



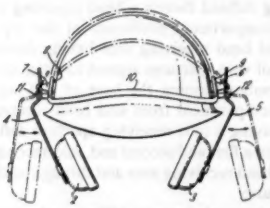
1. In an outer short pants and convertible skirt garment having leg portions and a crotch portion connecting a front edge portion to a back edge portion, the improvement comprising releaseable fastening means connecting said crotch portion, said means including an elongated hook fabric means extending along said back edge portion, said fastening means further including an elongated pile fabric means extending along said front edge portion, said hook means being connected to the outer surface of said garment and said pile means being connected to the inner surface of said garment, said hook means and pile means being in face to face adhering contact for substantially sealingly connecting said front and back portions and forming said crotch portion of said pants garment, said hook means being folded onto itself to partially connect same in an inwardly directed back pleat and said front edge portion being folded inwardly to form a front pleat, whereby said pants garment is selectively convertedinto a skirt with inwardly directed front and back pleats.

4,104,743

DEVICE FOR SAFETY-HELMET WITH EAR MUFFLERS

Erik Bøttger, Kjelsåsveien 61, Oslo 4, Norway

Filed Feb. 16, 1977, Ser. No. 769,152
Claims priority, application Norway, Mar. 10, 1976, 760835
Int. Cl.[2] A42B 1/24
U.S. Cl. 2—423 6 Claims



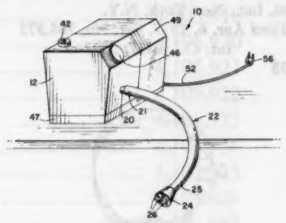
1. Device for a safety-helmet with ear mufflers, where each ear muffler is mounted on an arm which is mounted pivotally on the helmet, in a plane parallel to the longitudinal direction of the helmet, characterized in that the mufflers with arm are also pivotable in a plane across the longitudinal direction of the helmet, from a noise deadening position where the mufflers lie against the ears, to a swung-out and stopped position from the ears, and that the inner end of each muffler arm, which is fastened to the helmet, can be controlled by the end of a control bail, which stretches around the contour of the helmet, from the one fastening point for a muffler arm to the other fastening point, the bail legs of which are fastened so that they can be turned at the fastening points of the two muffler arms.

4,104,744

WASHING DEVICE

Clyde Odencrantz, 357 W. 29th St., New York, N.Y. 10001

Filed Feb. 15, 1977, Ser. No. 763,410
Int. Cl.[2] A45D 19/00
U.S. Cl. 4—159 4 Claims



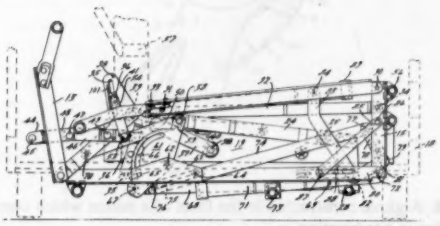
1. A washing device comprising a sealable fluid containing chamber normally partially filled with air and fillable with a liquid to a maximum given level and having an exit port disposed below the given level, said fluid chamber includes an aperture disposed above the given liquid level, means defining a filling aperture disposed in said fluid chamber above said given liquid level and a cap releasably connectable to said filling aperture and constructed to provide an air tight seal therebetween when connected, whereby said air pump provides said pressure in said chamber at levels greater than said release pressure when continuously operated, a hose having a first end connected to said exit port and a second end, means for increasing the pressure of the air to at least a given pressure including an air pump having a pressure outlet connected to said aperture and in air tight fluid communication with said fluid chamber, a pressure relief valve means settable to a predetermined release pressure greater than the given pressure and disposed to sense the pressure in said fluid chamber above the given liquid level thereby preventing the maximum pressure in said fluid chamber from exceeding the release pressure, check valve means disposed between said exit port and said second end of said hose and operable at the given pressure for allowing the passage of liquid through said hose and discharging out of said second end only when the air pressure is equal to or greater than the given pressure and whereby said liquid is maintained in said chamber when said air pressure is less than said given pressure.

4,104,745

SOFA BED WITH TV HEADREST

William Pacitti, Monroe, Mich.

Filed Feb. 25, 1977, Ser. No. 771,909
Int. Cl.[2] A47C 17/14
U.S. Cl. 5—13 12 Claims



1. In a sofa bed, a sofa frame having a back, sides and a front board which forms a closed storage area, a foldable bed frame received within said area with a TV rear head section extending upwardly within the back storage area and the other sec-

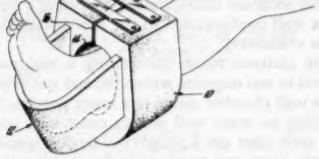
tions folded and disposed rearwardly of the front board, the TV rear head section is pivoted to the rear of a rear bottom section which is pivoted to the rear of a vertical intermediate section the front of which is pivoted to a front top section, plates at the inner sides of the sofa frame, an arm pivoted to each said plate at the forward end thereof, a link pivoted to each said plate near the rear end thereof, a bellcrank having the end of one arm secured to the pivot between the TV and rear bottom sections, the other arm of the bellcrank having an extending slot therein, and pivot means joining the bellcrank near the corner between said two arms with the end of said link which is pivoted to said plate.

4,104,746

FOOT CRADLE

Verena M. Goetz, 80 Vernon Dr., Scarsdale, N.Y. 10583

Continuation of Ser. No. 696,769, Jun. 16, 1976, abandoned.
This application Sep. 12, 1977, Ser. No. 832,451
Int. Cl.[2] A47C *21/00*
U.S. Cl. 5—327 R **5 Claims**



1. A foot support comprising:

a base member formed of a generally pliable yet resilient and firm material for vertically supporting a patient's leg above the level of a horizontal surface upon which the patient is lying;

said base member being formed with a generally horizontally extending opening for receiving a patient's leg and sized to prevent the horizontal removal of the patient's foot longitudinally therethrough, a slot being formed therein extending from the outer periphery of said base member to said opening so that the patient may insert his foot into said opening by passing his leg transversely through said slot;

a sling member formed of a generally pliable yet resilient and firm material attached to said base member to extend at a gradually declining angle with respect to the vertical extensions of said base member and engageable with the underside of the patient's foot to prevent said base member from moving up the patient's leg;

said opening in said base member being formed so that, when a patient's leg is disposed within said opening in a support posture, said sling member engages the underside of the patient's foot;

said sling member and said base member being sized to engage only the foot and lower leg beneath the calf of a patient when worn thereby; and

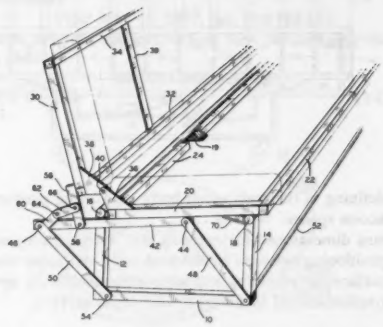
said foot support being unattached to any other structure, whereby a patient wearing said foot support may freely walk about while wearing said foot support.

4,104,747

CONVERTIBLE SOFA AND BED STRUCTURE

Richard A. Bell; Earl C. Wallace, and Ted W. Winters, all of Andrews, Ind., assignors to General Engineering and Mfg. Corporation, Andrews, Ind.

Filed Apr. 14, 1977, Ser. No. 787,447
Int. Cl.[2] D47C *17/17*
U.S. Cl. 5—37 R **5 Claims**



1. A convertible seat and sofa structure comprising:

a base frame;

a seat frame;

a back frame;

hinge means pivotally interconnecting said seat and back frames;

a carrier bar;

a pair of lever arms;

means pivotally securing one end of each of said lever arms to said base frame;

means pivotally securing the opposite end of each of said lever arms to said carrier bar so as to cause said carrier bar to extend for and aft with respect to said seat frame when said seat frame is in a horizontal position;

a crank arm affixed to the opposite end of one of said lever arms;

means pivotally securing said back frame to said carrier bar;

a drag link; and

means pivotally securing one end of said drag link to said crank arm at a point spaced from said lever arm and the other end of said drag link to said back frame, whereby when said carrier bar is moved to a forward position said crank arm forces said back frame to pivot about the pivotal connection between said back frame and said carrier bar to move said back frame to a horizontal position in alignment with said seat frame.

4,104,748

HOSPITAL BED AND PATIENT-HANDLING APPARATUS

Paul R. Brisco, 3402 Davis St., Oakland, Calif. 94601

Filed Apr. 8, 1977, Ser. No. 786,118
Int. Cl.[2] A47C *3/32*; A61G *7/00, 7/04*
U.S. Cl. 5—63 **10 Claims**

1. In combination:

a mattress formed with a plurality of longitudinally spaced transversely extending rows of passages extending between the normally upper body-supporting surface and lower mattress-supporting surface and defining access spaces between said rows;

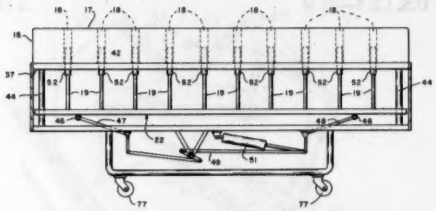
a platform engaging and supporting said lower surface of said mattress;

a plurality of vertically set tubular guides mounted on said platform and extending into said passages;

a plurality of members mounted for reciprocation in said guides, one in each of said guides, and having body-engag-

ing ends normally positioned at or below said upper surface in a body-supporting position of said upper surface;

means for simultaneously displacing said members in said guides for extension above said upper surface for engaging and elevating a body thereon, certain of said members



defining in their advanced body supporting position said access spaces;

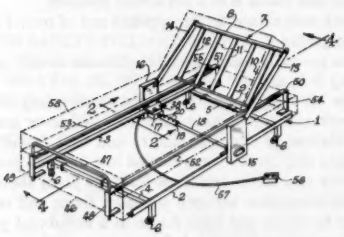
means dimensioned for entering said access spaces and for positioning between an elevated body and upper mattress surface for receiving and supporting said body upon retraction of said members to said upper surface.

4,104,749

ELECTRICALLY ADJUSTABLE BED FRAME

Anthony F. Grundler, San Diego, Calif., assignor to Siesta Industries, San Diego, Calif.

Filed Sep. 6, 1977, Ser. No. 830,526
Int. Cl.[2] A47C *3/32*
U.S. Cl. 5—76 **8 Claims**



1. In a bed comprising a mattress, a foundation under the mattress and a supporting frame having two lateral horizontal elements along each side of the foundation, a device for raising the head section of the mattress to various angular positions which comprises:

a flat lifting frame inserted between the foundation and the head section of the mattress;

a pair of lifting levers at opposite sides of the bed, each having one end pivotally connected to the lifting frame whereby the lifting frame is free to rotate around a first horizontal axis joining one said end of each lifting lever to the other;

means for pivotally connecting each lifting lever to the lateral horizontal elements at points which produce a second horizontal axis of rotation extending across the width of the bed; and

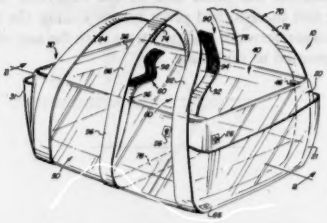
means for pivotally moving the lifting levers about said second horizontal axis whereby the first horizontal axis of the lifting frame is pushed upward by the lifting levers or allowed to fall back toward the foundation.

4,104,750

INFLATABLE INFANT CRIB AND CARRIER

S. Louis Kelter, and Viviane S. Kelter, both of 1302 W. Sack Dr., Phoenix, Ariz. 85027

Filed Mar. 4, 1977, Ser. No. 774,514
Int. Cl.[2] A47C *27/08, 9/00*
U.S. Cl. 5—93 R **5 Claims**



1. Inflatable crib apparatus, comprising, in combination:

inflatable wall chamber means, including

first and second inflatable end chambers spaced apart from each other and disposed substantially parallel to each other,

first and second inflatable side chambers spaced apart from each other and disposed substantially parallel to each other and secured to the first and second end chambers to define a generally rectangular peripheral wall, and

the first and second end chambers and the first and second side chambers each having a generally oval vertical cross sectional configuration providing a vertical convex wall configuration to the area within the end and side chambers;

inflatable mattress means comprising a mattress chamber secured to and disposed within the end and side chambers of the wall chamber means at a lower portion thereof and including an inner wall and an outer wall spaced apart from each other and a plurality of flexible spacers secured to both outer and inner walls for limiting the distance between the inner and outer walls to provide a generally flat surface upon which an infant is disposed;

valve means comprising at least a single valve for each of the first and second end chambers, the first and second side chambers and the mattress chamber for inflating and deflating each of said chambers and to prevent the deflation of any one chamber from resulting in the deflation of any other chamber; and

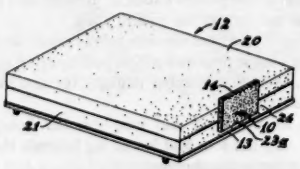
strap means secured to the wall chamber means and to the mattress means for carrying the crib apparatus.

4,104,751

ENDBOARD AUXILIARY DEVICE FOR BEDS

M. Steele Churchman, 6215 Central Ave., Indianapolis, Ind. 46220

Filed Jan. 21, 1977, Ser. No. 760,931
Int. Cl.[2] A47C *21/02*
U.S. Cl. 5—327 R **5 Claims**



1. An endboard auxiliary device for a bed, comprising:

an endboard means;

an endboard-support means;

means supportingly interconnecting the support means and the said endboard means;

the said endboard-support means being relatively long and relatively thin, in a manner providing that in installation it may be slipped under the mattress of the bed without significantly raising the mattress and long enough so as to be firmly held in place by the mattress-portion thereabove without being easily dislodged, and without requirement of any position-maintaining means other than the said thereabove mattress-portion and by the force reaction between it and the endboard-support means without other fasteners;

in a combination in which the said supportingly-interconnecting means provide that the said endboard means and the said endboard-supporting means are movably interconnected, and there are provided movement-blocking means which block against movement of the said endboard means relative to the said endboard-supporting means;

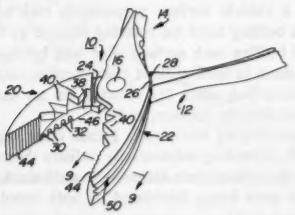
in which there is also provided an endboard accessory which effectively raises the height of the endboard, there being means provided which releasably secure the same to the said endboard means; and

in which the said releasable securing means of the endboard accessory and the endboard means comprise pin members extending downwardly from the said endboard accessory and fit into receiving holes provided in the upper portion of the said endboard means.

4,104,752
MULTIPURPOSE TOOL

Wayne Thomas Amrein, 1105 Apt. F. D'Long Rd., Baltimore, Md. 21228, and Stokes, Jr. Bernard E., 2639 Rayner Ave., Baltimore, Md. 21216

Filed Jan. 17, 1977, Ser. No. 759,987
Int. Cl.² B25B 7/22
U.S. Cl. 7—107 **10 Claims**



1. A multipurpose tool comprising:

(a) a pair of handle portions adapted to be gripped in the hand of a user;

(b) a pair of head portions each being formed in one piece formation with a respective handle portion, each of said handle and head portions being rotatably mounted to the other about a pivot point;

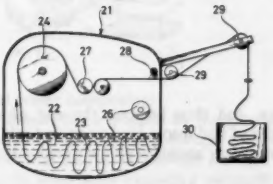
(c) wire stripping means formed in each of said head portions, said wire stripping means including at least one recess of predetermined diameter formed within each of said head portions and adapted for cutting insulation on wire when said recesses are displaced into contiguous alignment defining a closed position; and,

(d) tooth gripping means formed in each of said head portions, said tooth gripping means including at least a pair of teeth formed in each of said head portions adjacent said wire stripping means and displaced therefrom in a direction coincident with an axis line of said pivot point, said tooth gripping means and said wire stripping means being formed in one piece formation on opposing surfaces of said head portions with respect to said axis line direction, said teeth of said tooth gripping means forming an opening greater than said recess diameter when said tool is in said closed position.

4,104,753
PROCESSES AND APPARATUS FOR THE BATCH WET TREATMENT OF TEXTILE MATERIAL

Manfred Schuierer, Michelstadt, Fed. Rep. of Germany, assignor to Bruckner Apparatebau GmbH, Erbach Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 795,512
Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623315
Int. Cl.² D06B 21/02
U.S. Cl. 8—152 **12 Claims**



1. A process for the wet treatment of textile material comprising introducing said material to a treatment chamber containing a bath of hot treatment liquid; repeatedly immersing and removing said material in and from said liquid; subjecting said material to treatment by air following each removal of said material from said liquid to remove surplus liquid from said material; moving said material out of said chamber following a final air treatment; and spraying onto said material a fluid having a temperature lower than that of said liquid to cool said material prior to passage of said material out of said chamber.

9. Apparatus for the wet treatment of textile material comprising means forming a chamber for containing a bath of hot treatment liquid; means for moving said material through said container to repeatedly immerse and remove said material in and from said liquid; air means operable to remove surplus liquid from said material; means mounting said air means in a position to subject said material to the operation of said air means each time said material is removed from said liquid; and cooling means withn said chamber downstream from said air means for spraying said material with fluid having a temperature lower than that of said liquid to cool said material following its final removal from said liquid.

4,104,754
PROCESS FOR THE MANUFACTURE OF SHOES HAVING A WOODEN BASE

Jose Maria Tutusaus Almao, Diagonal 674 - 1°2ª, Barcelona, Spain

Filed Feb. 10, 1977, Ser. No. 767,634
Claims priority, application Spain, Dec. 2, 1976, 453.882
Int. Cl.² A43D 9/00; A43C 13/00; A43B 13/08
U.S. Cl. 12—142 S **1 Claim**

1. A process for the manufacture of shoes having a wooden base, said process comprising:

providing a wooden monopiece base member having a configuration corresponding to the desired shape of a finished shoe;

cutting said base member along a path substantially parallel to the upper surface thereof which will act as the support for the foot of the user, to thereby form a sole portion and a strip-shaped insole portion;

forming a plurality of elongated openings through said insole portion at positions therein parallel with the edge thereof;

forming recesses in the bottom surface of said insole portion

such that said recesses join said openings and extend therefrom inwardly of said insole portion;

providing front and heel shoe upper portions with flap-shaped extensions;

attaching said upper portions to said insole portion by passing each of said extensions through a corresponding said

opening, and then bending the end of said extensions inwardly of said insole portion so that said extension ends are completely housed within corresponding said recesses; and

rigidly fastening said insole portion to said sole portion such that the bottom surface of said insole portion is in contiguous contact with the upper surface of said sole portion.

4,104,755

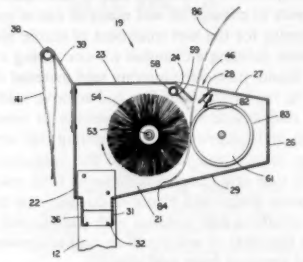
VEHICLE FLOOR MAT WASHER

Judson L. Smith, 5432 Lighthouse La., Tempe, Ariz. 85283

Filed Aug. 2, 1976, Ser. No. 710,630

Int. Cl.² B08B *11/00*; A46B *13/04*

U.S. Cl. 15—40 **10 Claims**



1. A mat washer comprising:

a housing;

scrubbing roll means and support roll means enclosed in said housing and having substantially horizontal, parallel, and horizontally spaced rotational axes;

said housing having a slot at the top to admit a mat into a work area in said housing between said roll means;

motor drive means coupled to said scrubbing roll means for rotational drive thereof;

cleaning fluid dispenser means enclosed in said housing above said scrubbing roll means for applying cleaning fluid to one face of a mat admitted into said work area;

said scrubbing roll means having work contacting means thereon moving proximate a support surface of said support roll means for contacting said one face and thereby urging a mat disposed between said scrubbing roll means and said support roll means against said support surface to implement scrubbing of the mat by said work contacting means;

said dispenser means include a distribution pipe extending parallel to said axes and having a plurality of spray nozzles spaced along it above said scrubbing hole means and directed toward said support roll means for spraying cleaning liquid onto the scrubbing roll facing face of a mat passing vertically between said roll means;

said housing being constructed to drain continuously from said work area all fluid dispensed and thereby avoid accumulation of fluid around said roll means;

leg means supporting said housing; and

dispenser control means including a valve in a liquid conduit between a cleaning liquid source and said dispenser means, and a valve control pedal for operating said valve;

said valve including a flexible walled tube and a pair of cooperating tube-pinching members, one of said members being fixed to said leg means, and the other of said members being fixed to said pedal.

4,104,756

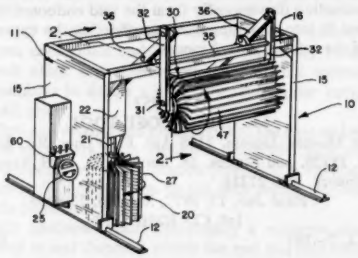
MACHINE FOR WAXING VEHICLES

William J. Gasser, Long Grove, Ill., and Richard H. Cooper, Genoa City, Wis., assignors to Brite-O-Matic Manufacturing, Inc., Arlington Heights, Ill.

Filed Oct. 12, 1976, Ser. No. 731,831

Int. Cl.² B60S *3/06*

U.S. Cl. 15—97 B **1 Claim**



1. In a vehicle surface preparation and waxing machine having a buffing head for rotating relative to the vehicle surface and buffing such surface after wax has been applied, the improvement in buffing head construction, comprising:

a. a mounting shaft for rotating on an axis substantially parallel to the surface, and

b. a plurality of fabric pads ½ inch thick aligned with said shaft, extending substantially radially therefrom, and having their inner ends fastened to such shaft,

c. said pads being fabricated of both wool and synthetic fibres,

d. each of such pads being slit inwardly from its outer edge at approximately 2½ inches intervals to define a series of strips,

e. each said strip being approximately 12 inches long.

f. said pads being slit so that a strip in each pad overlaps two strips in each adjacent pad.

4,104,757

POWER DRIVEN DRAIN CLEANER WITH SAFETY OVERLOAD CLUTCH

Arthur A. Silverman, 2245 Harmain Rd., Pittsburgh, Pa. 15235

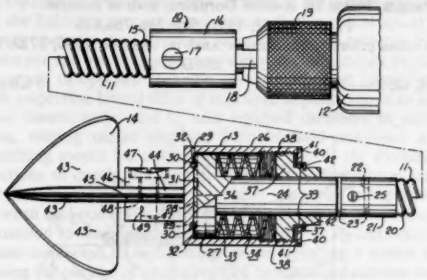
Continuation of Ser. No. 710,552, Aug. 2, 1976, abandoned. This application May 5, 1977, Ser. No. 794,011

Int. Cl.² B08B *9/02*

U.S. Cl. 15—104.3 SN **4 Claims**

1. In a power driven drain cleaner, the combination comprising: an elongated flexible sewer snake for attachment at one end to a rotary power drive and a sewer cleaning head secured to the other end of said snake; the improvement consisting of an overload slip clutch interposed at said other end of said snake adjacent said sewer cleaning head to permit slippage of

said clutch upon application thereto of a predetermined torque created between said snake and said cleaning head, and feed-



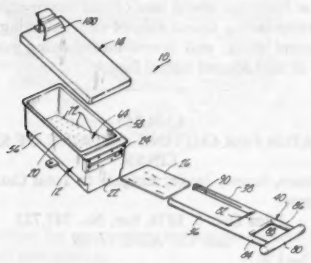
back means for transmitting feedback signals to said one driven end of said snake when said clutch is slipping for detection.

4,104,758

CREDIT CARD WASHING DEVICE

James L. Stotler, 11243 McKinney Ave., Detroit, Mich. 48224

Filed Apr. 4, 1977, Ser. No. 784,133
Int. Cl.[2] A46B *11/00*; B08B *1/00*
U.S. Cl. 15—104.92 **5 Claims**



1. A device for washing credit cards and the like, said device comprising:

an enclosed housing having an aperture, said housing having a liquid holding portion below said aperture;

brush means disposed in said liquid holding portion;

a holder for supporting a credit card, said holder being insertable through said aperture;

means guiding said holder to said brush means to facilitate the cleaning of said credit card when disposed between said brush means; said holder having a body portion and handle means extending from said body portion to facilitate the gripping of said holder by a user; and

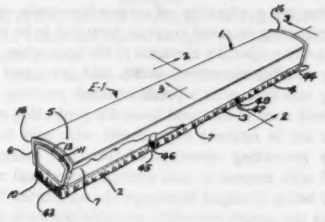
a pair of leg members extending outwardly from said holder, said leg members each having opposing longitudinal slots for receiving and supporting a credit card, the outer peripheries of said leg members having circular configurations; said legs being movable toward and away from each other; the interior walls of said housing defining said guiding means in the form of slotted portions defining guideways respectively receiving said leg members of said holder to guide said holder toward and away from said brush means; said guideways having a tapered path such that said legs are urged toward one another to tightly grip said card as said holder is inserted within said housing.

4,104,759

CUSTODIAL ERASER

Oliver R. Odhner, R.D. #2, Gerloff Rd., Schwenksville, Pa. 19473

Filed May 2, 1977, Ser. No. 792,921
Int. Cl.[2] A46B *3/02*; B43L *21/00*
U.S. Cl. 15—176 **5 Claims**



1. A custodial eraser comprising:

an elongated handle to be gripped by the hand and guided over the board for the erasing operation, the handle being C-shaped in cross section to provide a closed side and a pair of spaced apart walls extending outwardly from the closed side, the space between the extremities of the walls forming an open side and during an erasing operation the closed side being adapted to be contacted by the palm of the hand and the walls to be contacted by the fingers;

a section of flexible foam on the inside of the closed said and being co-extensive with the handle;

a plurality of individual erasers disposed within and serially arranged along the housing, each being coupled to said foam and extending thru and outwardly of the open side;

means to maintain the individual erasers within the handle in engagement with the foam and providing for each eraser to be disengageable from the foam and handle;

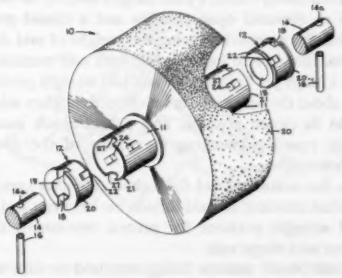
the flexibility of said foam and said means providing for the individual erasers to compress the foam and independently move toward the closed side in response to hand pressure when the eraser is being moved over the board for an erasing operation and to move away from the closed side when the hand pressure is relieved.

4,104,760

ROTARY BRUSH ROLL CONSTRUCTION

Richard B. Rosseau, Claremont, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 9, 1976, Ser. No. 656,473
Int. Cl.[2] A46B *13/02*
U.S. Cl. 15—179 **5 Claims**



1. In a rotary brush roller comprised of a tubular open-ended metallic core of cylindrical shape having brush means secured to its outer cylindrical surface and extending radially therefrom, the improvement comprising a pair of fittings arranged

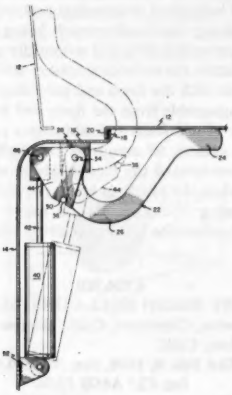
to be received in each end of said core, each of said fittings being comprised of an elastomeric material having a Shore scale A hardness within the range of from about 85 to about 100, each of said fittings having an axially extending passage therein arranged to snugly receive a rotatable driving or support means, said core at each end thereof having a plurality of radially inwardly projecting elements spaced circumferentially about the interior cylindrical wall of said core, each of said fittings having a plurality of circumferentially spaced and axially extending recessed portions arranged to be received by said inwardly projecting elements of the core when said fitting is axially slidably assembled within said core, and means for retaining said fittings in a predetermined position within the ends of said core so that said inwardly projecting elements of the core are in resilient engagement with said fittings, said inwardly projecting elements of the core being yieldably mounted with respect to said interior cylindrical wall of the core and being arranged to engage the associated fitting radially along the axially extending recessed portions thereof.

4,104,761

MOUNTING MEANS FOR DOOR-CHECK FOR TORSIONALLY BALANCED HATCHWAY DOOR

Robert J. Lyons, 1060 Ridge Rd., Hamden, Conn. 06514

Filed Jul. 13, 1977, Ser. No. 815,362
Int. Cl.[2] E05F *3/00, 5/10*
U.S. Cl. 16—84 **4 Claims**



1. In a torsionally balanced hatchway door construction having a hatchway frame, a door hinged thereto for movement between an elevated open position and a closed position, a torsion bar for counterbalancing the weight of said door, said torsion bar having a straight portion with said terminal portion forming a hinge pin for the door and said straight portion being pivoted about the hinge axis in one direction when said door is swung to its closed position, and a fluid check member for yieldingly resisting swinging movement of the door to its closed position,

means for mounting said fluid check member comprising a bracket mounted on said torsion bar between said terminal and straight portions for pivotal movement therewith about said hinge axis,

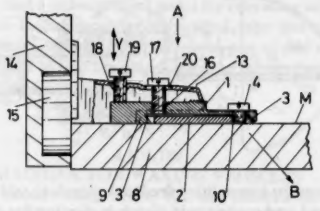
said fluid check member being mounted on said hatchway frame and having an actuating element connected to said bracket at a point spaced from said hinge axis such that said actuating element is driven by the pivotal movement of said bracket against the resistance of said check member as the door is closed.

4,104,762

FURNITURE HINGE

Erich Röck, Küferstr. 1085, A-6973 Höchst, and Bernhard Mages, Härte 10, A-6850 Dornbirn, both of Austria

Filed Apr. 11, 1977, Ser. No. 786,678
Claims priority, application Austria, Apr. 14, 1976, 2723/76
Int. Cl.[2] E05D *7/04*
U.S. Cl. 16—129 **7 Claims**



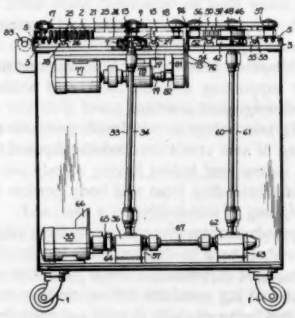
1. A hinge for fastening to a member of piece of furniture, such as a side panel, comprising: a mounting plate fixable to said member of said furniture a hinge arm carrying hinge links; an intermediate part located between said mounting plate and said hinge arm, said intermediate part and said mounting plate having oblique lateral faces parallel to a pivoting axis of the hinge, said faces corresponding to one another and being spaced from each other at least in the direction of the length of said hinge arm; screw means; said intermediate part being held in position at least on said mounting plate by said screw means; all said oblique lateral faces being inclined in the same direction so that said intermediate part is hooked onto said mounting plate by at least one of said oblique lateral faces in at least one point and at least one lateral face of said intermediate part lies atop a corresponding lateral face of said mounting plate in at least a second point, said screw means being positioned in proximity of said second lateral face.

4,104,763

APPARATUS FOR CUTTING A STRING OF SAUSAGE LINKS

Mano Tetsuro, Sanno, Japan, assignor to Total Company Limited, Japan

Filed Dec. 6, 1976, Ser. No. 747,722
Int. Cl.[2] A22C *11/00*
U.S. Cl. 17—1 F **7 Claims**



1. An apparatus for cutting a string of sausage links at a junction between links comprising, conveyor means for advancing the links at a first speed including a pair of spaced apart opposed movable roller belts defining a passageway for the links, each roller belt having a plurality of spaced rotatably mounted rollers disposed therealong engageable with respective lateral sides of the links to pinch them and advance the

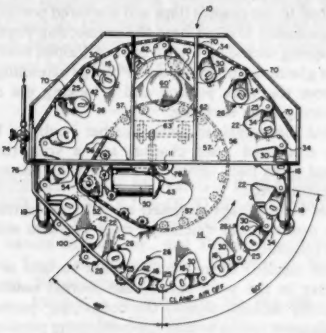
string as the roller belts move and drive means connected to said roller belts for moving them along said feed passageway, stretching means spaced from said conveyor means for receiving the links from said conveyor means and for further advancing the links at a second speed greater than said first speed to stretch each junction between links as it passes between said conveyor and stretching means, said stretching means including a pair of opposed movable notched members engageable with respective lateral sides of said links to pinch the links and drive means connected to said notched members to move them, cutting means disposed between said conveyor and stretching means for cutting a selected one of the stretched junctions to divide the sausage string into lengths of at least one link including a cutting member movable in the space between said conveyor and stretching means and drive means connected to said cutting member for moving it, and control means connected to said cutting means including a sensor for sensing the passage of each stretched junction and activate said cutting member drive means when a selected one of said stretched junctions passes said sensor.

4,104,764

CRUSTACEAN CLAW-PROCESSING MACHINE

John B. Coast, Rte. 6, Box 328, Baton Rouge, La. 70815

Filed Nov. 26, 1976, Ser. No. 744,958
Int. Cl.[2] A22C *29/00*
U.S. Cl. 17—71 **16 Claims**



1. A machine for processing seafood to expose the inner meat product comprising:

a support frame;

a cutting section having at least one cutter means therein mounted on said frame;

a multiple number of seafood holders placed in juxtaposition to said cutting section for cutting the exterior of the seafood in each said holder, each said holder having a holding section for holding the seafood with respect to said cutter means while it is being cut;

limit means for limiting the depth of cut for producing a peripheral cut in the outer portion of the seafood as the seafood is moved; and

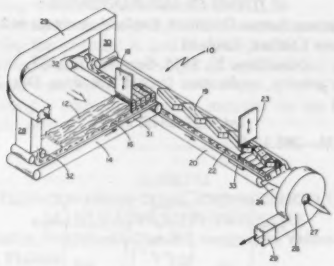
movable, carrying means on which said holders are rotatably mounted in spaced array for carrying and moving said holders with their seafood into and out of engagement with said cutter means in sequential fashion, said carrying means being movably mounted on said frame; said movable carrying means comprising a rotary frame; said holders being also pivotably mounted around the periphery on said rotary frame, said holders being urged toward said cutter means while the seafood is being cut; the plane of rotation of said holders on said rotary frame being inclined, making a significant angle with respect to the horizontal plane, and the cutting edge of said cutter means being located totally within the area circumscribed by said rotary frame and near one vertical extreme of travel of said holders, said holders being mounted on said rotary frame by means of pivot arms which are generally freely movable, gravity being the force causing the urging of said holders toward said cutting means toward and into the interior of said rotary frame about said pivot arm, said holders being moved away from said cutter means by the rotation of said rotary frame.

4,104,765

CUTTING HARD FIBROUS MATERIAL

Peter Lehner, Hingham, Mass., assignor to Leigh Textile Company, Boston, Mass.

Filed May 31, 1977, Ser. No. 801,576
Int. Cl.[2] D01G *1/04*
U.S. Cl. 19—0.6 **4 Claims**



1. The method of cutting longer lengths of hard fibrous material into shorter lengths comprising:

depositing a first layer of said shorter lengths on a supporting surface;

loading a second layer of said longer lengths on top of said first layer; and

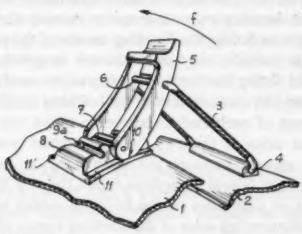
moving a blade down through said first layer and into and partially through said second layer, leaving a gap between said supporting surface and said blade whereby relative movement of said fibrous material may take place in said gap.

4,104,766

CLOSING SYSTEM FOR SKI BOOTS

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. des Etablissements Francois Salomon & Fils, Annecy, France

Filed Mar. 22, 1977, Ser. No. 780,180
Claims priority, application France, Mar. 29, 1976, 76 09009
Int. Cl.[2] B27K *3/04*
U.S. Cl. 24—69 SK **14 Claims**



1. A knuckle joint-type closing system for ski boots, for bringing together first and second flaps of the boot, said system comprising: at least one lever hinged to the first boot-flap and a traction component hinged to the second boot flap and to the lever, one of the lever's hinges including a catch-pin, rack means provided with at least one notch for freely engaging said

catch-pin, the lever being capable of occupying an initial, closed position flap against the boot, a second, stable intermediate partially-open position, and a third, fully-open position in which the catch-pin is disengaged from the notch, and means for making the catch-pin automatically leave said notch when the opening lever movement is continued beyond the stable intermediate position, thereby separating the two boot-flaps.

4,104,767

SLIDING CLASP FASTENER

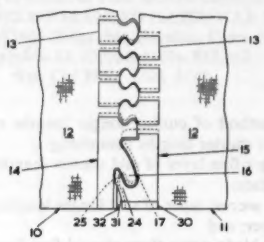
David Warren, Sutton Coldfield, England, assignor to Lightning Fasteners Limited, England

Filed Sep. 27, 1976, Ser. No. 727,385

Claims priority, application United Kingdom, Oct. 22, 1975, 43361/75

Int. Cl.[2] A44B *19/36*

U.S. Cl. 24—205.11 R **2 Claims**



1. A sliding clasp fastener comprising two stringers, each stringer having a series of coupling elements secured to an edge of a carrier tape, the two series of coupling elements being interengaged and disengaged by movement of a slider longitudinally of the stringers, and a pair of interengageable releasably connectable end fittings secured one to each of the carrier tapes adjacent an end of the series of coupling elements, each end fitting comprising two hooking means positioned one at each side of a plane which is substantially parallel with a plane of the carrier tapes, both hooking means of the one fitting being directed away from its associated series of coupling elements and forming two recesses to receive the hooking means of the other fitting, both hooking means of the other fitting being directed toward its associated series of coupling elements and forming two recesses to receive the hooking means of said one fitting, the hooking means of the pair of end fittings being mutually engageable in one longitudinal direction, each end fitting further comprising transversely opposed surfaces formed by side surfaces of the hooking means, the two hooking means of each end fitting being offset one from the other so that sides of the two hooking means provide said transversely opposed surfaces, the offset in the two end fittings being in opposite lateral directions when the end fittings are interengaged so that sides of the hooking means of one end fitting laterally overlap sides of the hooking means of the other end fitting, the resulting arrangement being such that, when the two series of coupling elements and the pair of end fittings are interengaged, the hooking means prevent separation of the end fittings laterally of the carrier tapes, the transversely opposed surfaces of the end fittings prevent separation thereof transversely of the plane of the carrier tapes, and the interengagement of the coupling elements prevents longitudinal separation in the opposite longitudinal direction.

4,104,768

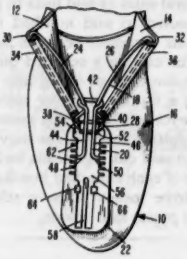
FASTENING DEVICE

Karl W. Labecki, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Filed May 25, 1977, Ser. No. 800,479

Int. Cl.[2] A44G *19/00*

U.S. Cl. 24—207 **1 Claim**



1. A fastening device for fastening two flaps of a closure comprising

a bent wire grasshopper spring including a connecting portion, a pair of arms extending from the connecting portion, a pair of arm extensions extending from the arms and attached to the closure flaps and a hooked portion on each arm extension hooked onto the connecting portion,

a yoke spring including a yoke portion looped over the arms of the glasshopper spring, a pair of legs extending in parallel from the yoke portion and a locking pin extending outwardly from each leg,

a molded thermoplastic plate member having a longitudinally elongated yoke channel and a yoke recess both formed in its back surface with the yoke recess being at one end thereof,

a pair of locking tabs disposed on the back surface of the plate member and extending over opposite sides of the yoke channel,

a journal member formed on the back surface of the plate member in the yoke recess, the journal member being integrally molded around the connecting portion of the grasshopper spring so that the connecting portion is freely pivotable but is securely retained within the journal member, and

the plate member having formed in it along the sides of the yoke channel a plurality of adjustment holes adapted to receiving the locking pins of the yoke spring, each of the adjustment holes being slotted toward the back surface of the plate member by a molded slot so that the adjustment holes can be easily formed in the plate member, the molded slots being narrower than the locking pins so that the locking pins will be retained in the adjustment holes.

4,104,769

APPARATUS FOR STRETCHING FILM

Stanley Burton Levy, and William Drake Garlington, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 12, 1976, Ser. No. 666,263

Int. Cl.[2] D06C *3/04*

U.S. Cl. 26—92 **6 Claims**

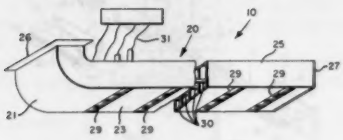
1. An apparatus for stretching a web of thermoplastic polymeric film including:

(a) a tenter frame having a plurality of tenter frame clips carried by two endless chains and guided by tracks having parallel and diverging sections; and

(b) a heating unit for heating a web of film moving therepast to a stretching temperature, said heating unit positioned entirely between the tenter frame clips in a parallel section of the tenter frame and closely adjacent a surface of the web of film, such isolation of the heating unit allowing

thicker portions of the film web to stretch more uniformly in the diverging section of the tenter frame to improve the thickness properties thereof, said heating unit including:

(i) a duct having a top wall, a bottom wall and side walls, and, further, having a plurality of intermediate walls extending parallel with the side walls and defining, with the top and bottom walls, thermally isolated zones in the duct, said bottom wall having a plurality of apertures with each aperture extending thereacross normal to said side and intermediate walls;



(ii) a heater positioned in each thermally isolated zone; and

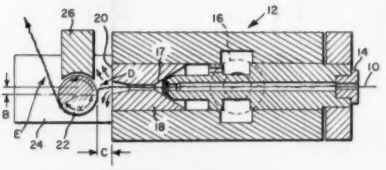
(iii) means for varying the temperature of each heater, independently, whereby air moving through any thermally isolated zone is selectively heated and passed through the apertures in the bottom wall to heat the film web adjacent to those apertures and to minimize dissipation of heat into adjacent zones.

4,104,770

YARN TREATING JET MOVING A ROTATING BAFFLE AND DEFLECTOR AT ITS OUTLET AND METHOD OF OPERATION THEREOF

William Moore Massey, Jr., and Theodos Sandukas, both of Hixson, Tenn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 31, 1977, Ser. No. 801,568
Int. Cl.² D02G *1/16*
U.S. Cl. 28—257 **5 Claims**



1. In a yarn treating jet including a body having yarn inlet and outlet ends connected by a central bore along a central axis, means for introducing pressurized gas through a gas inlet into said bore between said ends to contact yarn passing through the jet, said yarn and said gas following a path from said outlet end of said jet, the improvement comprising: a freely rotatable cylinder having an axis in a plane perpendicular to said central axis positioned a fixed distance from said yarn outlet end for engaging the yarn and gas exiting therefrom, said axis of said cylinder being positioned below said central axis, said yarn engaging said cylinder and passing below and partially around the cylinder and then in an upwardly direction in said path; and a deflector positioned above and in close proximity to said cylinder, said deflector diverting gas above said cylinder away from said yarn traveling in said upwardly direction in said path.

4,104,771

METHOD OF MANUFACTURE AND RETINA FOR PYROELECTRIC VIDICON

Wellman L. Clark, Springfield; John T. Cox, Alexandria; Gerald Klauber, Fredericksburg; Ferdinand C. Petito; John B. Ramsey, Jr., both of Alexandria, and John E. Waylonis, Fairfax Station, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 647,271, Jan. 7, 1976. This application Nov. 11, 1976, Ser. No. 741,010
Int. Cl.² H01J *31/49*; B05D *5/12, 3/06, 3/12*
U.S. Cl. 29—25.14 **13 Claims**

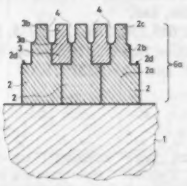
1. A method for fabricating a retina for a pyroelectric vidicon or other optical device comprising the steps of:
forming a wafer of pyroelectric material;
polishing the surface of said material;
immediately sealing said material in a vacuum chamber;
reducing the pressure in said chamber;
depositing a non-reflective layer of metal on one broad side of said wafer;
depositing a layer of dielectric material on the remaining broad side of wafer.

4,104,772

STRIP-COVERED ROLL AND METHOD FOR MANUFACTURING THE SAME

Väinö Sailas, Vaajakoski, Finland, assignor to Valmet Oy, Helsinki, Finland

Filed May 12, 1977, Ser. No. 796,193
Claims priority, application Finland, May 17, 1976, 761390
Int. Cl.² B30B *3/00*
U.S. Cl. 29—121.4 **10 Claims**



1. In a roll of the type which is used in a paper machine, an inner body and a plurality of strips circumferentially surrounding and covering an outer surface of said inner roll body, said strips including pairs of strip portions situated one next to the other axially along the roll body with each pair of strip portions extending through 360° around the roll body and with each pair of strip portions including one strip portion which at least in part circumferentially surrounds and overlaps at least part of the other of each pair of strip portions, said one of each pair of strip portions circumferentially pressing radially inwardly against at least said part of the other of each pair of strip portions and pressing at least said other of each pair of strip portions against the outer surface of said inner roll body.

4,104,773

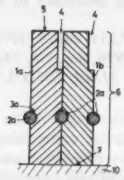
ROLL MANUFACTURING METHOD AND ROLL, PARTICULARLY FOR PAPER MACHINES

Väinö Sailas, Vaajakoski, Finland, assignor to Valmet Oy, Helsinki, Finland

Filed Jun. 1, 1977, Ser. No. 802,316
Claims priority, application Finland, Jun. 4, 1976, 761602
Int. Cl.² B30B *3/00*
U.S. Cl. 29—127 **8 Claims**

1. In a roll of the type which is adapted to be used in a paper machine, an inner roll body of cylindrical configuration having an elongated central axis and an exterior cylindrical surface, and an elongated strip having successive portions circumferen-

tially surrounding said inner roll body and engaging said exterior surface thereof with said circumferential portions of said strip having opposed side surfaces arranged with the side surface of one circumferential portion of said strip engaging the side surface of the next circumferential portion of said strip,



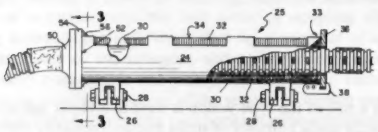
said engaging side surfaces of successive circumferential portions of said strip respectively being formed with registering grooves which cooperate to define an elongated bore circumferentially surrounding said inner roll body and spaced therefrom, and an elongated interlocking member situated in said bore.

4,104,774

APPARATUS FOR APPLYING FILTER TO A DRAINAGE TUBING

Richard C. Overmyer, Francesville, and Mario Guerra, Zionsville, both of Ind., assignors to Francesville Drain Tile Corporation, Francesville, Ind.

Division of Ser. No. 645,254, Dec. 29, 1975, Pat. No. 4,003,122. This application Sep. 15, 1976, Ser. No. 723,238
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—234 **14 Claims**



1. Apparatus for applying filter cloth or the like to a continuous length of flexible drainage tubing as such tubing is being installed in the ground by a laying machine, comprising

a tubular mandrel of a size to freely pass the tubing lengthwise therethrough and having an entrance end and an exit end,

a long tubular sleeve of filter cloth or the like, larger than the mandrel, gathered and packed on the mandrel, means to support said mandrel, with the packed sleeve thereon, on a laying machine in a position for passage of the tubing through the mandrel as the tubing is being laid, so that by attaching the end of the sleeve to the tubing, such sleeve will be drawn off the mandrel as the tubing passes therethrough on its way to installation,

said support means receiving and supporting the mandrel for ready removal therefrom and having mandrel-stop engaging means at the entrance end of the mandrel for positioning the mandrel in a predetermined axial position,

the mandrel having mandrel-stop means at its entrance end for engaging said stop-engaging means,

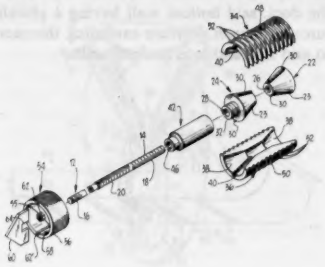
and feed-controlling means mounted at the exit end of the mandrel, in predetermined relation with said mandrel-stop engaging means, for controlling the rate at which the filter sleeve is drawn off the mandrel.

4,104,775

EXTRACTION TOOL

Earl E. Lawless, P.O. Box 472, Georgetown, Calif. 95634

Filed Oct. 12, 1976, Ser. No. 731,161
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—265 **13 Claims**



1. An extraction tool for use in separating a pair of generally tubular members, said tool comprising:

expandable jaw means for engaging one of said tubular members, said expandable jaw means including an outer surface adapted to grip an interior surface of one of said tubular members; and

expanding means coupled to said expandable jaw means for providing substantially uniform radial expansion of said jaw means, said expanding means including a pair of oppositely disposed complementary expander heads and means connected to the expander heads for effecting relative and equal movement of each of said expander heads in opposing directions, said expanding means further including means for inhibiting relative rotation of said expandable jaw means during expansion thereof, said inhibiting means including at least one protrusion located on a surface of each of said expander heads and at least one longitudinal groove formed in said expandable jaw means adapted to slidably receive said protrusions.

4,104,776

AUTOMOTIVE PRESS

Anthony Caccioli, Longmeadow, Mass.; Philip A. Carlson, Glastonbury, Conn., and David M. Guidi, Springfield, Mass., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

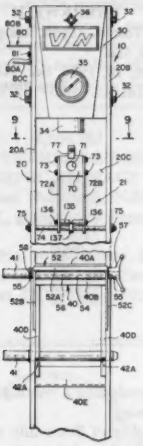
Filed Sep. 29, 1977, Ser. No. 838,031
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—281.3 **19 Claims**

1. A center column press for use in automotive related applications, said press comprising:

a vertical center column mounted on a base, said column having a vertically extending center wall interconnecting two vertically extending side walls to define at least one vertically extending channel on each side of said center wall;

press means contained within one of said channels, said press

means including a moveable ram adapted to travel in a vertical direction to effect a pressing operation; and



a work table adjustably mounted on said center column within said one channel between said press means and said base.

4,104,777

REPAIR OF BOTTLE TOP MOLDS

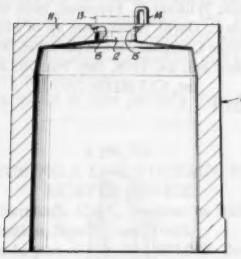
John Douglas Furness, Glamorgan, Wales, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

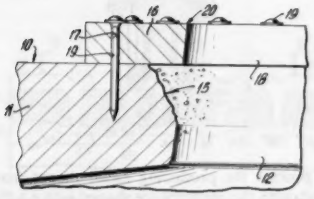
Filed Jun. 16, 1975, Ser. No. 586,934

Claims priority, application United Kingdom, Jun. 18, 1974, 26874/74

Int. Cl.[2] B23P *7/00*; B22D *19/10, 7/06*

U.S. Cl. 29—401 D **3 Claims**





1. In a bottle top mold having an opening in the top of the mold through which molten metal is poured into the mold and a plug arranged to seat in the opening and afford an effective closure, the method of repairing an eroded surface in the opening in which the plug seats with the eroded surface preventing an effective closure of the opening by the plug, comprising positioning a ring-shaped member with an opening therein arranged to receive the plug for the mold over the eroded opening in the top of the mold and with the ring-shaped member in contact with the top of the mold and located above the eroded surface for completely covering the upper portion of the eroded surface of the opening with the central axis of the ring-shaped member in axial alignment with the central axis of the opening in the top of the mold and with the surface defining the opening in the ring-shaped member in register with the surface which originally defined the mold opening and securing the ring-shaped member to the mold so that the plug in the opening in the ring-shaped member affords an effective closure of the opening in the mold, forming the ring-shaped member with its height in the axial direction of its opening approximately one-half of its width in the radial direction, and securing the ring-shaped member to the top of the mold by explosively driving fastening members through the ring-shaped member into the top of the mold.

4,104,778

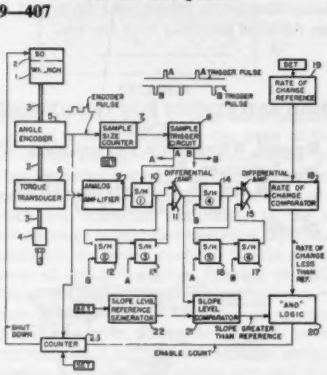
METHOD AND APPARATUS FOR FASTENER TENSIONING

Walter Carl Vliet, Landing, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 27, 1977, Ser. No. 762,988

Int. Cl.[2] B23Q *5/00*

U.S. Cl. 29—407 **7 Claims**



1. A method of threaded fastener tensioning comprising:

rotating the fastener;

monitoring the torque and rotation applied to the fastener to determine when the rate of change of torque increase per unit of rotation becomes a constant; and

rotating the fastener a prescribed rotary angle after said rate of change of torque increase per unit of rotation becomes a constant.

4,104,779

TIGHTENING METHOD AND SYSTEM

Jerry A. Sigmund, Willow Grove, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Dec. 29, 1976, Ser. No. 755,408

Int. Cl.[2] B25B *23/14*

U.S. Cl. 29—407 **19 Claims**

11. A method for tightening a fastener system in a joint assembly until the yield point or similarly significant point has been detected, said method comprising:

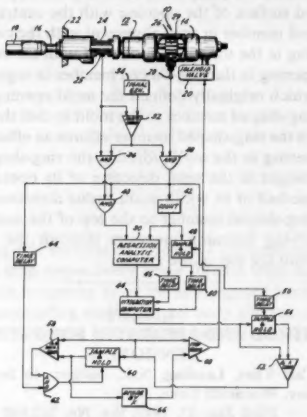
applying tightening characteristics to the fastener;

measuring a first tightening characteristic and a second tightening characteristic during the tightening cycle;

calculating the area between predetermined increments of said second tightening characteristic under the curve of said first tightening characteristic vs. said second tighten-

ing characteristic which could be plotted for said tightening characteristics;

determining the change between successive incremental areas; and,



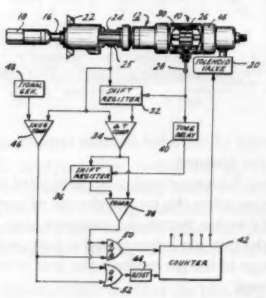
examining changes in incremental areas and determining when the yield point has been reached.

4,104,780

METHOD AND SYSTEM FOR TIGHTENING JOINT ASSEMBLY

Jerry A. Sigmund, Willow Grove, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Dec. 29, 1976, Ser. No. 755,410
Int. Cl.² B25B *23/14*
U.S. Cl. 29—407 **18 Claims**



10. A method of tightening an assembly including a fastener system until the yield point or some similarly significant point has been detected, said method comprising:

applying tightening characteristics to the fastener;

measuring a first tightening characteristic and a second tightening characteristic during the tightening cycle;

determining the instantaneous slope between predetermined increments of the second tightening characteristic of the curve of said first tightening characteristic vs. said second tightening characteristic which could be plotted for said tightening characteristics for the fastener being tightened;

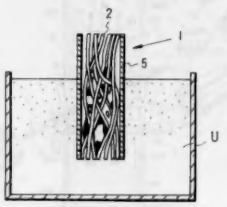
determining when the fastener has been tightened through a predetermined measure of said second tightening characteristic from the increment of said second tightening characteristic at which the maximum slope of the curve has been detected.

4,104,781

METHOD OF MANUFACTURING A MARKING PEN HAVING A NIB AND AN INK RESERVOIR INTEGRAL THEREWITH

Yoshio Midorikawa, Tokyo, Japan, assignor to Glasrock Products, Inc., Fairburn, Ga.

Filed Jun. 10, 1976, Ser. No. 694,524
Int. Cl.² B23P *17/00*
U.S. Cl. 29—419 R **3 Claims**



1. A method for producing a writing nib having an integral ink reservoir comprising:

(a) forming a plurality of fibers into a fiber bundle;

(b) forming a sheath around the outer periphery of said fiber bundle;

(c) dipping one end of the sheathed fiber bundle into a mixture of urethane prepolymer, water and a solvent for said prepolymer; then

(d) polymerizing said prepolymer in said sheathed bundle whereby the gases generated by reaction and by volatilization of the solvent form capillary passages substantially longitudinally of said bundle; and

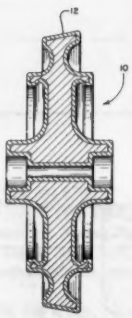
(e) after the polymer has set, grinding the dipped end into the form of a cone.

4,104,782

METHOD FOR CONSOLIDATING PRECISION SHAPES

Stewart J. Veeck; William R. Freeman, both of North Muskegon, and Louis E. Dardi, Muskegon, all of Mich., assignors to Howmet Turbine Components Corporation, Muskegon, Mich.

Filed Jul. 14, 1976, Ser. No. 705,087
Int. Cl.² B22D *11/126*
U.S. Cl. 29—527.2 **9 Claims**



1. In a process for producing metal shapes from powder particles wherein the particles are shaped into a self-sustaining porous preform which is subjected to a hot isostatic pressing operation consisting of locating the preform in a chamber having a surrounding gaseous atmosphere and heating the preform in said chamber to an elevated temperature while isostatic pressure is being applied, said temperature being sufficient to densify said preform and consolidate said particles through bonding thereof, the improvement comprising the

steps of forming an all-encompassing porous coating on the preform prior to hot isostatic pressing, subjecting the coated preform to a vacuum whereby the preform is degasified, heating the coated preform, while maintaining the vacuum, to a temperature sufficient to fully density said coating so that the coating becomes non-porous and pressure-tight, and thereafter subjecting said preform to said hot isostatic pressing, said coating being solid during said hot isostatic pressing.

4,104,783

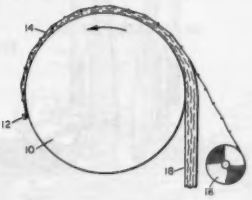
METHOD OF THERMALLY INSULATING A CRYOGENIC STORAGE TANK

Jeffrey A. Schultz, East Rochester, N.H., and Paul J. Eifel, Walnut Creek, Calif., assignors to Process Engineering, Inc., Plaistow, N.H.

Continuation of Ser. No. 741,194, Nov. 12, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 845,871

Int. Cl.² B23P *11/02*

U.S. Cl. 29—451 **5 Claims**



1. A method of insulating a cryogenic storage tank having a container vessel and an outer jacket with a space to be evacuated therebetween, comprising the steps of:

providing a fiberglass insulation means,

wrapping the insulation means about at least a section of the vessel,

providing a pervious means,

securing an end of the pervious means to the vessel,

wrapping the pervious means about the vessel with the insulation means being concurrently wrapped therewith,

securing the pervious means at another end so that the insulation means is compressed,

and fitting the jacket at least partially over the vessel.

4,104,784

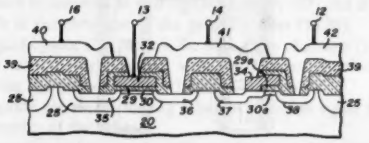
MANUFACTURING A LOW VOLTAGE N-CHANNEL MOSFET DEVICE

Thomas Klein, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 697,908, Jun. 21, 1976, abandoned. This application Apr. 1, 1977, Ser. No. 783,914

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 **6 Claims**



1. The method of making a low voltage high performance MOSFET integrated circuit having an enhancement transistor connected in series with a depletion transistor, said method comprising:

depositing boron through a first mask onto a p-type silicon substrate having a resistivity in excess of about 10 ohm centimeters in the region of said enhancement transistor, said boron deposit acting to substantially lower the silicon resistivity in the region of said enhancement transistor;

growing an oxide layer over said silicon substrate in the openings in said first mask;

depositing phosphorus through a second mask onto said substrate in the regions of said enhancement transistor and said depletion transistor, said phosphorus acting to increase the silicon resistivity in the region of said enhancement transistor and to convert the conductivity type of the silicon in the region of said depletion transistor;

forming source and drain members in each region along with an overlying gate electrode to complete said enhancement and said depletion transistors; and connecting said transistors in series.

4,104,785

LARGE-SCALE SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

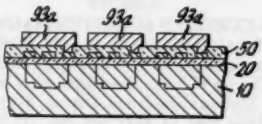
Hiroshi Shiba, and Kenji Kani, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1976, Ser. No. 660,426

Claims priority, application Japan, Feb. 28, 1975, 50-25354

Int. Cl.² B01J *17/00*

U.S. Cl. 29—574 **20 Claims**



1. A method of fabricating a large-scale semiconductor integrated circuit device comprising the steps of forming a plurality of circuit elements in a semiconductor substrate, forming a first insulating layer having openings therein on the main surface of said substrate, forming a first layer of unit cell wirings which are connected electrically to the elements through said openings in said first insulating layer, forming a second insulating layer having openings therein and covering said first layer of unit cell wirings, forming on said second insulating layer test pads connected electrically to predetermined portions of said unit cell wirings through the openings in said second insulating layer, testing the unit cells by using said test pads, removing all of said test pads from the surface of said second insulating layer after said testing step, and forming on said second insulating layer a second layer of wirings connected to said unit cell wirings through the openings in said second insulating layer.

4,104,786

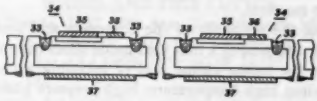
METHOD OF MANUFACTURE OF A SEMICONDUCTOR DEVICE

John K. Boah, Port Byron, and Richard W. Kennedy, Skaneateles, both of N.Y., assignors to General Electric Company, Auburn, N.Y.

Division of Ser. No. 635,747, Nov. 26, 1975, Pat. No. 4,063,272. This application Feb. 11, 1977, Ser. No. 767,946

Int. Cl.² B01J *17/00*

U.S. Cl. 29—583 **11 Claims**



1. A method of making semiconductor devices comprising the steps of:

providing a wafer of semiconductor material, said wafer

containing a first type of impurity for imparting one conductivity type thereto;

thermomigrating through said wafer a plurality of elongated bodies of a material which is an impurity of a second type which imparts the opposite conductivity type to said semiconductor material, said thermomigrating step forming a plurality of isolation regions that separate a plurality of device regions of said given conductivity type in said wafer;

diffusing an impurity of the second type into each major surface of said wafer so that each of said device regions comprises an interior region of said one conductivity type surrounded by semiconductor material of said opposite type;

forming a peripheral groove in each of said device regions in one of said major surfaces, said groove extending into the associated interior region such that the area of said one major surface within said groove is electrically isolated from the other major surface;

passivating said groove; and

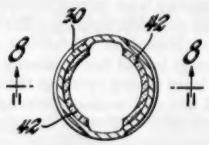
subdividing said wafer into semiconductor device pellets through said isolation regions, each containing one of said device regions.

4,104,787

FORMING CURVED WAFER THIN MAGNETS FROM RARE EARTH-COBALT ALLOY POWDERS

William F. Jandeska, Rochester; Charles F. Netherton, Marine City, and Charles W. Vigor, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1977, Ser. No. 779,525
Int. Cl.² H02K *15/02*
U.S. Cl. 29—596 **3 Claims**



1. A method of making a D.C. motor having thin, curved rare-earth cobalt permanent field magnets carried on the motor casing, comprising:

placing a mandrel having a working surface shaped to define the inner surface of a green powder compact of a curved magnet in a spaced apart positon adjacent to a die to form a molding cavity for said compact between the mandrel and the die,

filling the cavity with rare-earth cobalt metal powder,

magnetically aligning the powder to a radial direction with respect to the curvature of the desired permanent magnet,

compacting the aligned powder in the axial direction with respect to the curvature of the magnet to form a green compact having a pack density of at least 65% of the theoretical density of said powder,

positioning at least two such green compacts on a mandrel shaped to locate the magnets in their intended position in the motor casing and to form the interior curved surfaces of the magnets,

enclosing the assembly of the compacts and mandrel in a casing comprising a thin wall metal sheet capable of serving as the motor casing and of retaining a vacuum and excluding high temperature, high pressure gases,

evacuating the casing,

sealing the casing,

densifying the evacuated compacts under an isostatic gas pressure of from about 20 to 200 MPa at a temperature of from about 900° to 1200° C. for a time sufficient to densify the magnets and metallurgically bond them to the casing, and

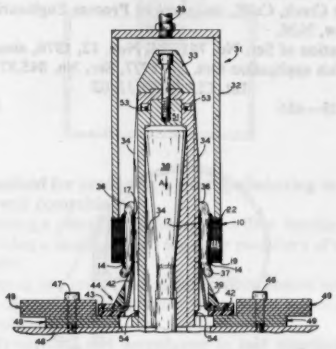
removing the mandrel.

4,104,788

METHODS FOR POSITIONING INSULATING MEMBERS IN MAGNETIC CORE SLOTS

Alan L. Kindig, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed Mar. 21, 1977, Ser. No. 779,777
Int. Cl.² H02K *15/10*
U.S. Cl. 29—596 **8 Claims**



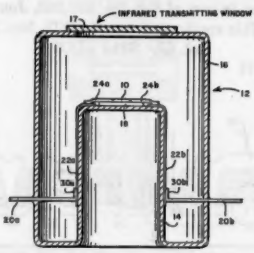
1. A method of performing a preselected manufacturing operation on a stator assembly and also axially repositioning a plurality of previously placed axially extending insulators carried in slots of a magnetic core along with side turn portions of at least one winding, said method comprising: performing the preselected manufacturing operation and, while performing such operation, also axially repositioning the plurality of previously positioned insulators along slots of the magnetic core.

4,104,789

PHOTODETECTOR MOUNTING AND CONNECTING

Gene A. Robillard, Stoneham, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.

Division of Ser. No. 614,804, Sep. 19, 1975, Pat. No. 4,005,288.
This application Nov. 15, 1976, Ser. No. 741,573
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **6 Claims**



1. A method of providing electrical connection to a photodetector, including a photodetecting material means having an initial lateral extent in directions parallel to a detecting surface therein, in photodetector mounting apparatus of the Dewar type having an inner flask, the method comprising:

forming an electrical lead tab in a manner permitting substantially retaining the initial lateral extent of the photode-

tecting material means such that the electrical tab lead has a part attached to the photodetector including attached to the photodetecting material means and another part projecting unsupported beyond the photodetector;

forming a conductive path on the inner flask, the conductive path extending from the side surface on to the top surface of the inner flask;

mounting the photodetector on the top surface of the inner flask with the projecting part of the electrical lead tab aligned with a part of the conductive path; and

bonding the electrical lead tab to the conductive path.

4,104,790

PIPE INSTALLING APPARATUS FOR LARGE HEAT EXCHANGERS

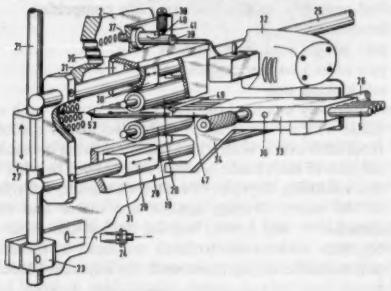
Gerhard Hindrichs, Wuesterfeld 25b, Wuppertal, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,131

Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620406

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—707 **8 Claims**



1. Mounting apparatus for inserting tubes into holes of perforated supporting plates of large heat exchangers, such as cooling condensers in power plants, comprising:

a cross slide arrangement (16) directly mountable on one of said tube supporting plates (2) and extending over a plurality of holes in said supporting plate;

a thrust assembly (17) mounted on said cross slide arrangement (16) being shiftable along said plurality of holes;

said thrust assembly (17) being provided with one or more parallel guide channels (18) which are alignable with the holes in said tube plates for guiding the tubes that are to be inserted by an electric motor-driven pair of rollers that are attached to said thrust assembly (17) for the advancing of the tubes;

said thrust assembly (17) comprising a guide piece (33) which is disposed in said thrust assembly (17) and is shiftable in the direction of the pair of rollers (19,20);

said guide piece (33) having the said guide channels (18) for the tubes being mounted with the terminal section (47) facing the pair of rollers (19,20);

said guide piece (33) having a height which is equal to the diameter of the tubes;

a swivelable locking device (49) mounted on said guide piece (33) that can be swivelled up by the tubes passing through and lying in front of its outlet end whereby said locking device (49) may be inserted between the rollers as a residual thrust rammer; and

control means to prevent the driven rollers from scoring the tubes inserted by changing, slowing or reversing the driving of the rollers.

4,104,791

STRIPPER FOR COATED WIRES

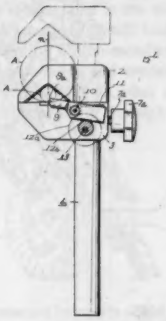
Takatoshi Sunahara, Matsumoto, Japan, assignor to Kabushiki Kaisha Izumiseiki Seisakusho, Matsumoto, Japan

Filed Jul. 18, 1975, Ser. No. 597,133

Claims priority, application Japan, Jul. 24, 1974, 49-88714

Int. Cl.[2] H02G *1/12*

U.S. Cl. 30—90.1 **1 Claim**



1. A tool for removing insulation from electric wires having a pair of wire-holding members movable towards and away from each other, one of said wire-holding members having a wire-contacting surface with a V-shaped wire-receiving recess in a plane perpendicular to the axis of the electric wire held between said wire-holding members, said one wire-holding member having a side surface mounting a cutter knife, said cutter knife having a middle portion pivotally connected to said side surface of said wire-holding member, the other of said wire-holding members having a planar cable-contacting surface, an edge of said cutter knife being positioned at the intersecting point of the bisector of the vertical angle of said V-shaped recess and said planar cable-contacting surface of said other wire-holding member, said edge of cutter knife being elastically urged against the insulation of the wire inserted in an opening formed between said wire-holding members, a plane including the wire-contacting surface of said other wire-holding member and perpendicular to the bisector of said V-shaped recess of the wire-holding members linearly contacting the wire held between the wire-holding members in the direcion of axis of wire; said side surface of said one wire-holding member further including a rotatable eccentric cam with an operation knob; a rear end portion of cutter knife being elastically urged against said cam; an end surface of said eccentric cam, and said side surface opposite thereto of a wire-holding member having pin means and holes engaging and disengaging to optionally set the angular position of said eccentric cam to slidingly move in the direction in which said pin means engages said holes.

4,104,792

WHEEL AND TIRE CUTTER

Roy E. LaBounty, 1607 - 8th Ave., Two Harbors, Minn. 55616

Filed Jan. 21, 1977, Ser. No. 760,840

Int. Cl.[2] E02F *3/28*; B23P *19/00*

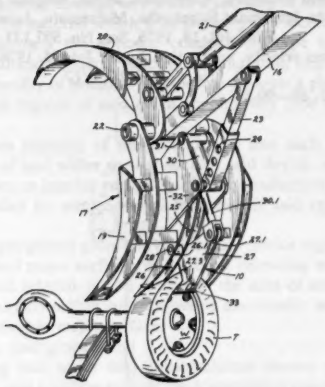
U.S. Cl. 30—134 **9 Claims**

1. Apparatus for handling scrap metal and especially for use in removing tires and handling and reprocessing wrecked automobile bodies, comprising:

a backhoe grapple having an upper jaw and a lower jaw,

a shear for slicing through such tires including a pair of

stationary cutting anvils affixed on the back side of the lower jaw of the grapple, and



a swinging shear blade mounted between such cutting anvils and swinging therealong and independently of said upper jaw and with a shearing action.

4,104,793

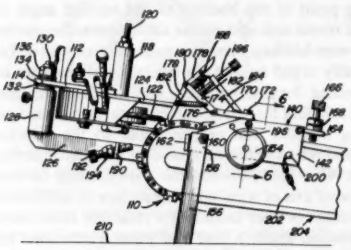
SAW CHAIN SHARPENER

Jack F. Simington, Chiloquin, Oreg., assignor to Simington Products Co., Chiloquin, Oreg.

Continuation-in-part of Ser. No. 516,129, Oct. 18, 1974, which is a continuation-in-part of Ser. No. 481,447, Apr. 29, 1975, Pat. No. 3,880,018. This application Feb. 25, 1977, Ser. No. 772,344

Int. Cl.² B23D *63/16*

U.S. Cl. 30—139 **9 Claims**



1. A chain saw sharpener, said sharpener including a mount, a rotary grinding member journalled from said mount for rotation about a first upstanding axis, a generally horizontal support arm, means oscillatably mounting said mount from one end of said support arm for angular displacement about a second axis generally paralleling and spaced to one side of said first axis, the other end of said support arm including chain saw bar support structure supported therefrom a chain saw bar nose end removably supported from said support structure with said bar generally paralleling said support arm and having its nose end facing toward said second axis and with at least the upper portion of said nose end exposed and the peripheral edges of said bar sufficiently free of adjacent obstructions to allow longitudinal shifting of a saw chain along said peripheral edges, said arm including depending support means for support from a support surface below said arm and adapted to support said nose end in slightly elevated position above said support surface when the end of the chain saw remote from said nose end rests upon said surface, the spacing between said second axis and said chain saw bar nose end being greater than the spacing between said axes and such to position angularly spaced peripheral portions of the side of said rotary grinding member remote from said second axis closely adjacent said nose end, and on opposite sides thereof, when said mount is swung to positions with said first axis closely adjacent opposite sides of a plane containing said second axis and generally paralleling said arm.

4,104,794

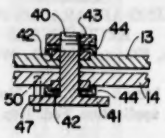
SCISSORS

Andrew C. Carroll, West Monroe, La., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,548

Int. Cl.² B26B *13/00*

U.S. Cl. 30—268 **2 Claims**



1. A scissors the two blades of which are pivotally joined by a bolted assembly, said bolted assembly comprising

a headed screw

a pair of split ring lock washers

a pair of lockwasher covers, and

a self-locking nut,

said assembly mounted through a pivot hole in each scissors blade with the inner faces of the two blades spaced apart from each other, with a lockwasher bearing on each external face of each blade, a lockwasher cover bearing against and enclosing the sides of each lockwasher, with the head of the screw bearing against one cover and the nut, threaded to the screw, bearing against the other cover, together with means to latch the head of the screw in non-rotatable engagement with the adjacent blade.

4,104,795

ELECTRICAL CUTTING APPLIANCES

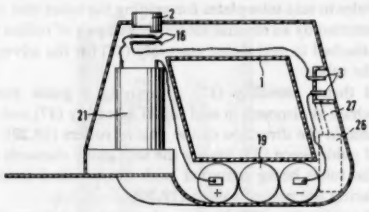
Franc Lopic, Burlafingen, Fed. Rep. of Germany, assignor to Gardena Kress & Kastner GmbH, Ulm, Fed. Rep. of Germany

Filed Oct. 12, 1976, Ser. No. 731,584

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1975, 2545838

Int. Cl.² B26B *7/00*

U.S. Cl. 30—272 A **3 Claims**



1. An electrical cutting appliance having a housing, blades, a motor for driving said blades, a primary electrical circuit incorporating said motor, a source of electrical energy within said appliance, and two pairs of switching contacts in series in said primary circuit for connecting said motor to said source of energy, one of said pairs of switching contacts being located externally of said housing, said housing having a manual grip, said external contacts being spaced from said grip a distance sufficient to insure that said contacts cannot be actuated by a

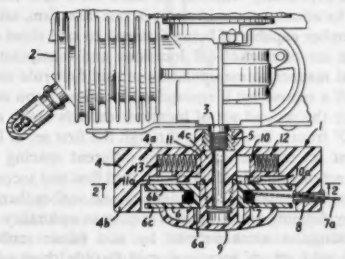
single hand holding said grip, the second of said pairs of switching contacts being located internally of said housing adjacent said grip, means for actuating said internal switching contacts, and a removable electrical plug means for connecting and disconnecting said external switching contacts to each other whereby said plug means must be used for operation of said appliance.

4,104,796

FILAMENT-TYPE TRIMMER

John D. Sheldon, Charlotte, N.C., assignor to Textron Inc., Providence, R.I.

Filed Jul. 29, 1977, Ser. No. 820,531
Int. Cl.[2] A01D *55/18*
U.S. Cl. 30—276 **8 Claims**



1. A filament-type trimmer comprising a rotatable housing, at least one spool rotatably supported by said housing, at least one filament wound on said spool, guide means on said housing past which an end portion of said filament extends in passing from said spool to the exterior of said housing whereby said end portion of said filament is extended from said housing by centrifugal force to act as rotary cutting means upon rotation of said housing at sufficient speed, means for rotationally driving said housing, said driving means having such speed-load characteristics that the speed of rotation increases with a decrease in load, means for normally restraining rotation of said spool relative to said housing and responsive to centrifugal force upon increase in the speed of rotation of said housing upon decrease in load on said driving means upon decrease in length of the extended end portion of said filament to release said spool for rotation relative to said housing by the pull exerted by centrifugal force on said extended end portion of said filament to thereby increase the length of said extended end portion of said filament.

4,104,797

ROTARY CUTTING ASSEMBLY

George C. Ballas, Houston, Tex., assignor to Weed Eater, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 633,456, Nov. 19, 1975, Pat. No. 4,035,912, which is a continuation-in-part of Ser. No. 321,580, Jan. 8, 1973, Pat. No. 3,826,068, which is a continuation-in-part of Ser. No. 207,198, Dec. 13, 1971, Pat. No. 3,708,967. This application Dec. 2, 1976, Ser. No. 747,004
Int. Cl.[2] A01D *55/18;* **B26B** *27/00*
U.S. Cl. 30—276 **20 Claims**

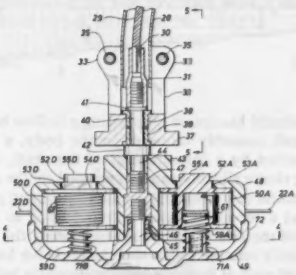
1. As a sub-assembly in apparatus for cutting vegetation and the like, means comprising

a rotary body rotatable about a concentric axis and having a plurality of internal circular compartments spaced about a concentric axis and each communicating separately with a corresponding plurality of equally spaced apart apertures each defined by spaced apart curvilinear wall portions of the periphery of said body,

said compartments in said rotary body also each communicating with one of a corresponding plurality of non-circular apertures equally spaced about said axis and between said axis and said periphery of said body,

a corresponding plurality of spool-like members each removably disposed in one of said circular compartments in said body and each having circular upper and lower flange portions rotatable in said compartments and a non-circular knob-like portion protruding from an upper flange portion and insertable in the corresponding one of said non-circular apertures in said body,

a corresponding plurality of non-metallic line members each having one end secured to and wound about one of said spool members and having its other end extending from the respective compartment through the corresponding



one of said apertures and radially outwardly of the periphery of said body,

a closing member detachably fastened to said rotary body for forming with said body a rotatable housing assembly securing said spool members in said compartments,

a corresponding plurality of spring members mounted in said closing member and yieldably thrusting said non-circular knob-like portions of said spool members insertably into and through said non-circular apertures in said body, and

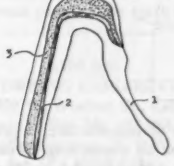
means for securing each of said spring members to said closing member, said securing means extending longitudinally into and along said spring member a distance greater than one third of the uncompressed length of said spring during relaxation of said spring.

4,104,798

PORCELAIN FUSED TO METAL CROWN

Shigeo Takahashi, and Michio Ito, both of Shioziri, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Matsumoto Dental College, Shioziri, both of Japan

Filed Jul. 21, 1976, Ser. No. 707,715
Claims priority, application Japan, Jul. 21, 1975, 50-89541; Jul. 22, 1975, 50-89781
Int. Cl.[2] A61C *5/08*
U.S. Cl. 32—12 **13 Claims**

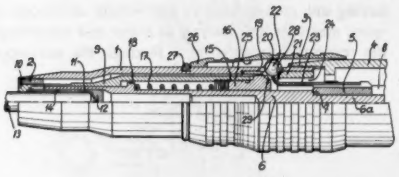


1. A porcelain fused to metal crown having a composite structure comprising layers of a bonding agent and ceramics which are thermally sprayed around the metal crown, and a layer of fused porcelain formed on the above layers.

4,104,799
DENTAL HANDPIECE

Henri Leonard, Besancon, France, assignor to Micro-Mega S.A., France

Filed Dec. 17, 1976, Ser. No. 751,999
Claims priority, application France, Dec. 22, 1975, 75 39915; Oct. 20, 1976, 76 32151
Int. Cl.[2] A61C 1/08
U.S. Cl. 32—26 9 Claims

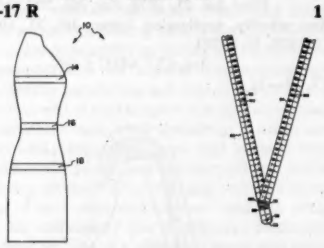


1. In a dental handpiece comprising a hollow body, a central rotary shaft rotatably mounted in the body, a tool-gripping chuck carried by a forward end of the shaft, a first chuck-actuating sleeve slidably axially mounted on the shaft between a first position corresponding to a tool-gripping position of the chuck and a second position corresponding to a tool-release position of the chuck, a first spring biasing the tool-gripping sleeve axially relative to the shaft, said sleeve having a generally conical wall, at least one radially-movable ball cooperating with said generally conical wall of the first sleeve, and an external second chuck-actuating sleeve on the body cooperating with the ball to radially inwardly move the ball to axially move the first sleeve against the action of the biasing spring, the improvement wherein said at least one ball is disposed in an opening of the body, a second spring biasing said ball radially outwardly to a rest position against an inner wall of the second sleeve and out of contact with said conical wall of the first sleeve, in which rest position of the ball the first sleeve is biased by the first biasing spring to said first position, the second sleeve being manually movable and having on its inner wall an inclined part which moves the ball radially inwardly against the action of the second spring through said opening into contact with said conical wall of the first sleeve to move the first sleeve to its second position in response to movement of the second sleeve.

4,104,800
KIT FOR DRAFTING GARMENT PATTERNS

Marjorie M. Dyal, 1934 S. Kenilworth, Berwyn, Ill. 60402

Division of Ser. No. 551,268, Feb. 20, 1975, Pat. No. 4,031,626.
This application Mar. 30, 1977, Ser. No. 783,022
Int. Cl.[2] A41H 3/06
U.S. Cl. 33—17 R 1 Claim



1. As an article of manufacture, a proportioned garment pattern construction kit comprising, in combination, a planar board suitable for receiving and holding pins and the like fastening means, a generally opaque and flexible sheet capable of being inscribed with a generally permanent graphical display, a first flat rule member having opposite ends and a first scale inscribed thereupon, the scale having first divisions equispaced along its length and having a row of perforations, each perforation intersected by one of said first divisions, one of said ends having secondary divisions taken along the first division adjacent said one end, said secondary divisions being spaced equally and dividing the said first division into equal quarter sections, a second flat rule member having opposite ends and a second scale inscribed thereon, said second rule member being longer than said first rule member otherwise carrying identical divisions and perforations, said first and second scales each having indicia coincident with the divisions thereof, one scale carrying different indicia than the other, said first rule member capable of being fastened to said sheet member at the location of one of said perforations carried by said first rule and pivoted alternatively 180 degrees about said location, said first and second rules capable of receiving marking means inserted through a selected one of said other perforations and thereafter the rule adapted to be pivoted about said insertion location 180 degrees, repeatedly whereby to mark off a first set of equispaced locations upon said sheet in one direction, said second rule member capable of being fastened to said sheet at one of the first set of marked-off locations and manipulated in an identical manner to manipulation of said first rule member to mark off a second set if equispaced locations upon said sheet, whereby the second set of locations extends along a line rotated 90° from a line passing through the first set of locations, said first set of locations having different spacing than the second set of equispaced locations, said first and second sets of locations being marked off to define lineal scribes therethrough whereby defining said graphical display as a plurality of identical rectangular areas defined by said linear scribes taken through said sets of locations, said flexible sheet adapted to have a light transparent sheet secured thereto superposed upon said graphical display and a curve scribing tool for scribing curvelinear representations with reference to at least a said pair of points located upon said graphical display, said curve scribing tool comprising a pair of flat arm members each carrying a quarter-inch reference scale and arranged one on the other in juxtaposed relation and pivotally secured at a location spaced from one of their ends, said arms capable of being spread by pivoting same in parallel planes, the pair of points being matched with a predetermined number along the scale of one and the other arm, one arm being pivotable in a horizontal plane relative to the other about a point represented by the pivot location juncture of the arms of the curve scribing tool when the points are matched with said predetermined number, the spacing on the reference scale being the same as the spacing of the first divisions carried by said rule members.

4,104,801
DRAWING INSTRUMENT

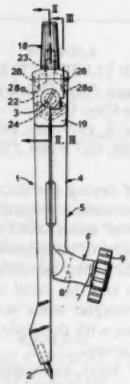
Raymond Anthony Payton, Bewdley, England, assignor to Helix International Limited, West Midlands, England

Filed Jul. 19, 1977, Ser. No. 817,104
Claims priority, application United Kingdom, Nov. 19, 1976, 48257/76
Int. Cl.[2] G01B 3/16
U.S. Cl. 33—27 B 8 Claims

1. A drawing instrument comprising:
(a) a pair of limbs including pivot holes in the inner ends thereof,
(b) a pivot received in said pivot holes and pivoting together said limbs forming an assembly at said inner ends,
(c) a bow top having an interior hole and fork limbs embracing the assembly of said inner ends of the pivoted limbs,
(d) said fork limbs including pivot holes for receiving said pivot which connects said pivoted limbs to the bow top,
(e) a centralizing member held between and keyed to said inner ends and including a portion which projects up into said interior hole,
(f) said centralizing member including an elongated pivot receiving hole,
(g) said centralizing member being effective to press against a sidewall of said hole in the bow top to cause the bow top

to turn and keep central upon any angular movement of the one said pivoted limb with respect to the other said pivoted limb, and

(h) said bow top including locating means cooperable with said inner ends to prevent, during assembly of the instrument with the centralizing member keyed in place between said inner ends of the two pivoted limbs positioned together side by side but before installation of the pivot, movement of said inner ends toward the bow top beyond a position in which said pivot receiving holes in said inner ends and said bow top are aligned for receiving the pivot.

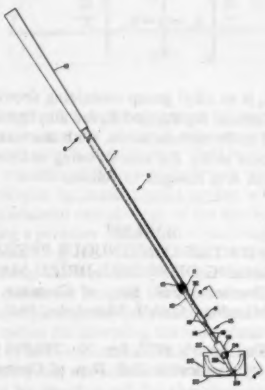


4,104,802

APPARATUS FOR USE IN MANUFACTURING AND SELECTING GOLF CLUBS

Clyde H. Johnston, 1182-15th St., Holly Hill, Fla. 32017

Filed Sep. 7, 1977, Ser. No. 831,247
Int. Cl.[2] G01B *5/00*; A63B *57/00, 69/36*
U.S. Cl. 33—174 F **4 Claims**



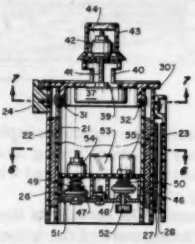
1. An apparatus for use in the manufacture or selection of a golf club best suited to a particular player comprising an elongated shaft having an extensible lower section, means for clamping said shaft in different extended positions, an extension connected to and extending from the distal end of the extensible section of said shaft and having a longitudinally extending flat portion, a plate disposed against said flat portion, means pivotally connecting said plate to the extension for pivotal movement about an axis generally orthogonal to the axis of said shaft, said plate having a straight bottom edge adapted to rest on a flat surface which supports a player gripping an upper portion of said shaft, said extension having an arm extending beyond said pivot means and disposed against one side of said plate, said arm having an indicator positioned in alignment with the axis of said shaft, said one side of the plate having angle markings thereon for use with said indicator to indicate the angle formed by the axis of the shaft and the bottom edge of said plate for indicating the correct angle of the sole of a golf club head relative to a golf club shaft of a length corresponding to the length of the adjusted shaft of the apparatus.

4,104,803

DIRECTION FINDING DEVICE AND GUIDANCE SYSTEM

Raymond W. Hoeppel, P.O. Box 997, Oak View, Calif. 93022

Filed Jan. 3, 1977, Ser. No. 756,172
Int. Cl.[2] G01C *17/30*
U.S. Cl. 33—352 **10 Claims**



1. A direction detecting assembly comprising a magnetic reed relay, said relay comprising a magnetic reed switch in flux coupling relationship with a solenoid, said relay being mounted rigidly on a first given framework; at least one source of magnetic bias affixed to said first given framework in flux coupling relationship with said relay; externalmeans to control at least one said source of bias; a power source; capacitive means; and electrical transducer means to indicate when switch contacts operate; said switch and solenoid being connected in circuit with said power source, capacitive means and transducer means so that the current through said solenoid and transducer means is controlled by the contacts of said switch, the flux from said solenoid opposing the flux produced by said source of bias, thus causing said switch to open and close in a vibrating manner at a rate proportional to the component of the earth's magnetic field in a direction generally parallel to the major axis of said switch, said transducer indicating the state of vibration of said contacts; position indicator means attached to said first given framework to indicate the relative orientation of said framework with respect to magnetic North; means to manually adjust the relative position of said position indicator means with respect to the major axis of said switch, so that the orientation of said first given framework will relate to true North rather than to magnetic North; and means to enable the maintainance of the major axis of said switch in a fixed position with regard to the horizontal plane of the earth at all times.

4,104,804

METHOD FOR DRYING EXPLOSIVE MATERIALS

Ralph G. Sargeant, 408 W. Windsor St., Lakeland, Fla. 33803

Continuation-in-part of Ser. No. 461,964, Apr. 18, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,663
Int. Cl.[2] F26B *3/34*
U.S. Cl. 34—1 **11 Claims**

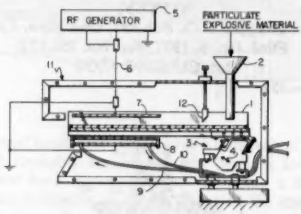
1. The method for drying explosive materials, comprising supplying the explosive material in particulate form to a drying zone;

passing the particulate explosive material through the drying

zone while agitating the explosive material to cause the particles thereof to move in random fashion without residing in contact with any solid surface and with no significant portion of the particulate material residing as a relatively static mass of particles;

subjecting the particulate explosive material to radio frequency radiation to heat the moisture contained within the particles while the particulate explosive material is being agitated in the drying zone;

maintaining a gaseous atmosphere in the drying zone during said steps of agitating and subjecting to radio frequency radiation,



said step of subjecting the particulate explosive material to radio frequency radiation causing moisture contained within each particle to be vaporized without substantial direct heating of the particle,

random movement of the particles of the explosive material resulting in exposure of the entire surface of each particle to said gaseous atmosphere for escape of the moisture from the particle into the atmosphere and transfer of heat from the particle to said gaseous atmosphere; and

recovering the particulate explosive material from the drying zone with the particles thereof having a reduced moisture content and a temperature which is low as compared to the ignition temperature of the particles.

4,104,805

SEQUENTIAL DRYING SYSTEM WITH ISOLATED CLOSED DRYING PATHS

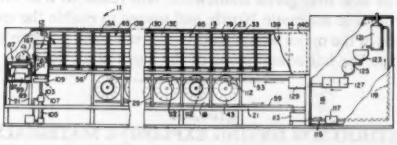
Thomas Margittai, State College, Pa., assignor to Seymour C. Yuter, Briarcliff Manor, N.Y., a part interest

Continuation of Ser. No. 444,456, Feb. 25, 1978, abandoned, which is a continuation of Ser. No. 284,209, Aug. 28, 1972, abandoned, which is a division of Ser. No. 65,400, Aug. 20, 1970, Pat. No. 3,738,016. This application Sep. 23, 1976, Ser. No. 726,166

The portion of the term of this patent subsequent to Jun. 12, 1990, has been disclaimed.

Int. Cl.² F26B *5/06, 13/30*

U.S. Cl. 34—5 **12 Claims**



11. A method of freeze drying at atmospheric pressure with a plurality of drying stations connected together to form a tunnel, comprising the steps of:

(a) separating and heat insulating the drying stations from each other, and thus enclosing their atmospheres, during drying intevals;

(b) maintaining the temperatures of some of the drying stations, during drying intervals, at different preselected temperatures below the freezing point of the material to be dried; and

(c) repeatedly circulating the enclosed atmosphere of each of the drying stations, first over the material to be dried to extract moisture therefrom, and then over a hygroscopic material to remove moisture in the circulating atmosphere.

4,104,806

METHOD OF FLUIDIZED BED DRYING

Robert J. Reusch, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jun. 2, 1977, Ser. No. 802,697

Int. Cl.² F26B *3/08*

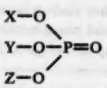
U.S. Cl. 34—10 **18 Claims**

1. In the method of drying particulate matter by fluidized bed drying the improvement comprising adding an effective amount, in the range of about 0.005 to about 0.25 parts by weight per hundred parts of particulate matter, of a fluidizing agent selected from the group consisting of:

(a) carboxylic acids and the metal salts and esters thereof, wherein the carboxylic acids are normal or branched hydrocarbon chain with the chain containing about 16 to about 30 carbon atoms,

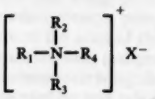
(b) metal salts of alkyl sulfonates and alcohol sulfates wherein the hydrocarbon chain contains about 16 to about 30 carbon atoms,

(c) phosphorus compounds represented by the formula



wherein X, Y and Z are hydrogen, a C_{16}–C_{30} alkyl group or a metal cation with at least one of X, Y, and Z being a C_{16}–C_{30} alkyl group,

(d) quaternary ammonium compounds represented by the formula



wherein R_1 is an alkyl group containing about 16 to about 30 carbon atoms, R_2, R_3, and R_4 are alkyl groups containing from 1 to 28 carbon atoms, with the total number of carbon atoms in R_2, R_3, and R_4 being not more than 30, and wherein X is halogen or sulfate.

4,104,807

MACHINE FOR THE CONTINUOUS PREPARATION AND PACKAGING OF FREEZE-DRIED MATERIALS

Hans Braun, Ilvesheim, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,896

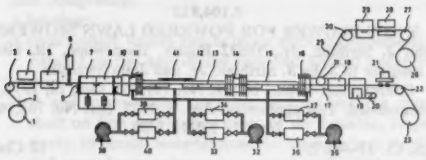
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615815

Int. Cl.² F26B *13/28, 13/30, 15/22*

U.S. Cl. 34—92 **7 Claims**

1. In an apparatus for the continuous preparation and packing of freeze-dried material, having a horizontally movable web and successively disposed forming, freezing, freeze-drying, heat-sealing, punching and transport devices, wherein the improvement comprises the freeze-drying devices consist of two successively disposed freezers having separate refrigerant circuits, and a primary drying tunnel and a secondary drying tunnel having separate evacuating and heating systems, her-

metically closable air locks located ahead of the primary drying tunnel, between the primary and secondary drying tunnels, and at the end of the secondary drying tunnel, said air locks comprising compressible and expandable walls, retractable tables and upwardly and downwardly opening slide valves for



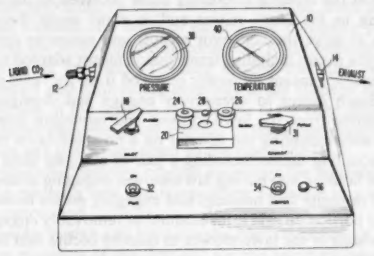
sealing the primary drying tunnel hermetically from the secondary drying tunnel and advancing means coupled to the air locks and movable in the horizontal direction to effect the expansion and compression of the air lock walls for advancing the movable web.

4,104,808

SEMI-AUTOMATIC CRITICAL POINT DRYING APPARATUS

John E. Horne, 6001 34th Ave., Hyattsville, Md. 20782; Stephen A. Van Albert, 12620 Springloch Ct., Silver Spring, Md. 20904, and A. J. Tousimis, 11504 Stonewood La., Rockville, Md. 20852

Filed Aug. 11, 1977, Ser. No. 823,793
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—243 R **3 Claims**



1. In a critical point dryer apparatus for preparing a specimen for examination by electron microscopy, said sample being saturated with a dehydrating fluid which is to be replaced by a transitional fluid which in turn is to be removed from the specimen by critical point drying while preserving the three-dimensional morphology of the specimen, said apparatus including a pressure chamber for receiving the specimen, means for precooling the chamber with the transitional fluid, means for filling the chamber with the transitional fluid in liquid form, means for purging the specimen of the dehydrating fluid, and replacing the dehydrating fluid with the transitional fluid, means for elevating the temperature and pressure of the chamber above the critical temperature and pressure of the transitional fluid, and means for removing the transitional fluid as a gas by bleeding off the chamber pressure until the chamber is at atmospheric pressure, said chamber having an inlet through which the transitional fluid enters the chamber and an outlet through which the transitional fluid leaves the chamber, the improvement comprising:

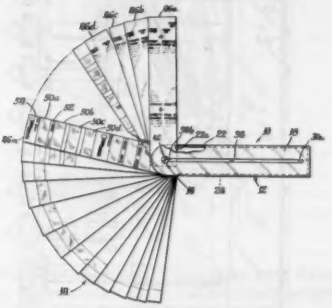
a manually controllable multi-way valve having an input port connected to the outlet of the chamber and at least a PURGE output port and a BLEED output port, and flow restriction means in communication with said PURGE and BLEED output ports for controlling the flow rates of the transitional fluid through the chamber during the purging of the specimen and the bleeding of the chamber, respectively, thereby preventing damage to the specimen by excessively high flow rates of the transitional fluid.

4,104,809

COLOR SAMPLE DISPLAY DEVICE

Frederick A. Day, Hanover Park, and Melvin D. Garbark, Schaumburg, both of Ill., assignors to Color Communications, Inc., Melrose Park, Ill.

Filed Sep. 30, 1976, Ser. No. 728,301
Int. Cl.[2] B44D *2/00*
U.S. Cl. 35—28.5 **4 Claims**



1. A color sample display device comprising, a case having an internal chamber open on at least one end and bounded by at least two side walls, said two side walls defining opposed elongated slots extending through said side walls and extending along the longitudinal lengths thereof, a support shaft having opposite ends received in and guided by said opposed slots for longitudinal movement along the lengths of said slots, said support shaft having enlarged head ends disposed outwardly of each of said slots and axially retaining said shaft within said slots, a plurality of discrete display strips pivotally carried by said support shaft, said display strips being of substantially equal size and being movable between a first position received within said internal chamber and a second position extending outwardly of said open end of said chamber, said display strips being in superimposed stacked relation when received within said chamber and being capable of movement to selectively fan one or more of said strips from the remainder of said strips when in said second position, selected ones of said strips having a plurality of color stripes disposed transversely thereon along the length thereof, said stripes on each of said selected ones of said strips being spaced from each other and identified by coded indicia, descriptive indicia on each of said selected ones of said strips adjacent each color stripe, and at least one of the uppermost of said plurality of display strips having indicia thereon indicating the particular one of the remaining strips on which a named color may be found.

4,104,810

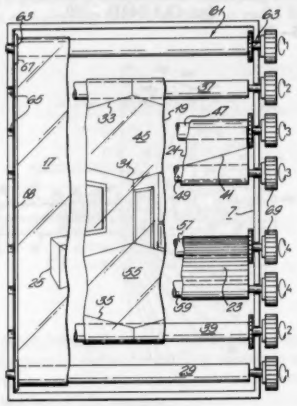
DISPLAY DEVICE

Serge Mirman, 9 Chesham Pl., Belgrave Sq., London SW1, England

Filed Apr. 26, 1977, Ser. No. 790,957
Int. Cl.[2] G09B *1/20*
U.S. Cl. 35—53 **10 Claims**

1. A display device suitable for illustrating a plurality of interior design schemes or for use as a teaching aid, said device comprising a case, at least two pairs of spools rotatably mounted in said case and extending across the case from one side wall to the opposite side wall, and being capable of limited axial sliding movement relative to said side walls, a roll of material adapted to be wound upon each of said pairs of spools, one of said rolls of material bearing alternative illustrations separated by transparent portions, a plurality of illustrations

complimentary to said illustrations on said one roll on the other of said rolls, a window in a wall of said case through which the various alternative illustrations may be displayed with a chosen illustration formed on the said other roll showing through a transparent portion of said one roll and the two rolls being suitably relatively orientated so as to build up a picture visible through said window, and means for rotating each of said spools so as to advance one roll relative to the other as desired in either direction to vary the picture presented at said window, and wherein a magnetic strip is located down one side edge of the case, and a magnetically attractable disc is associated with at least one spool of each pair, the spools being axially slidable away from said magnetic strip to disconnect the magnetic locking arrangement for winding on or winding back the roll, to change the illustration, and being slidable into engagement with said magnetic strip after setting up said illustration, thereby preventing subsequent inadvertent rotation of said spools due to the natural resiliency of rolls of material thereon.

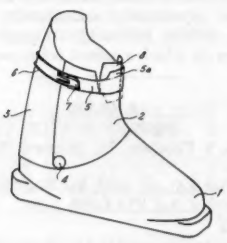


4,104,811

APPLIED TO SKI BOOTS

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. des Etablissements Francois Salomon & Fils, Annecy, France

Filed Mar. 28, 1977, Ser. No. 782,304
Claims priority, application France, Apr. 1, 1976, 76 09439
Int. Cl.[2] A43B *5/04, 11/00;* **A43C** *11/00;* **A43B** *21/00*
U.S. Cl. 36—121 **20 Claims**



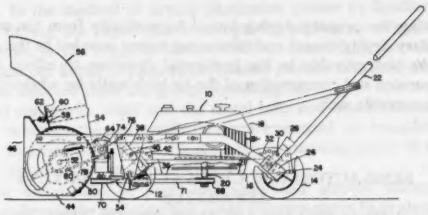
1. A ski boot comprising an upper whose stiffness is adjustable, an adjustable closure element surrounding said upper, and means for securing said closure element to said upper in one of a plurality of different positions for varying the stiffness and/or inclination of the upper respectively, said upper having a front portion with lateral edge regions, said closure element comprising a collar positioned for cooperating with said upper at the front portion thereof, said means for securing the closure element comprising means for removably attaching the collar to the upper at a selected one of a plurality of positions at said lateral edge regions.

4,104,812

SNOW BLOWER FOR POWERED LAWN MOWERS

John J. Stribiak, Jr., 18632 Poplar, Homewood, Ill. 60430, assignor to John J. Stribiak, Jr. and John Swanson

Continuation-in-part of Ser. No. 731,950, Oct. 12, 1976, abandoned. This application Apr. 6, 1977, Ser. No. 784,964
Int. Cl.[2] E01H *5/00*
U.S. Cl. 37—43 L **15 Claims**



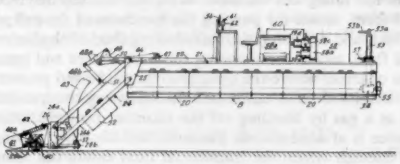
1. A snow blower adapter for use with a powered lawn mower having a pair of front wheels and and a pair of rear wheels, said adapter comprising a housing defining a forward opening adapted to receive snow therein, chute means in the housing positioned to displace snow therefrom, conveyor means in the housing to convey snow received in the central opening to the chute means and to expel snow therefrom, means to drive the conveyor means, said means to drive the conveyor means including transmission means adapted to drive the conveyor means by power received from the lawn mower and clutch means to operatively engage and disengage the transmision from the lawn mower, and mounting means for removably mounting the adapter on a powered lawn mower, said mounting means including a pair of elongate arms carrying the housing and having lawn-mower engaging means positioned opposite said housing, said engaging means including a slotted portion on said arms adapted to removably engage said rear wheels of the lawn mower to thereby secure said housing to the lawn mower.

4,104,813

MUCK DREDGING MACHINE

Duane A. Lindsey, 216 Meadowbrook Rd., Hopkins, Minn. 55343

Continuation of Ser. No. 716,141, Aug. 20, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,347
Int. Cl.[2] E02F *3/88*
U.S. Cl. 37—57 **5 Claims**



1. A machine for dredging and pumping semi-liquid material, the machine comprising:

a floating barge;

a boom structure pivotally mounted on the front of the barge, and extending forwardly therefrom;

first and second laterally disposed mud digging and collecting auger elements co-axially arranged and mounted on

the boom structure and delivering a material being dredged laterally inwardly from the outer ends toward the inner ends thereof;

a pumping unit mounted on the boom structure between the first and second auger elements and disposed therebehind to receive the material collected thereby, the pumping unit comprising:

a housing;

a rotary shaft within the housing disposed substantially parallel to the axis of the first and second auger elements;

first and second inlet openings surrounding the rotary shaft on first and second sides of the housing, respectively, to permit material from the inner ends of the first and second auger elements to pass into the housing, the first and second inlet openings being positioned above the elevation of the bottom of the first and second auger elements at all times;

impeller blade means within the housing and connected to the rotary shaft in radially spaced relation;

first and second rear mold boards mounted on opposite sides of the housing for guiding material from the first and second auger elements upward and inward to the first and second openings, respectively, each rear mold board having a lower front edge, an inside edge, an outside edge, an upper edge, and a side plate, the lower front edge being disposed behind one of the auger elements below the axis thereof, the rear mold board sloping generally upwardly and rearwardly from the lower front edge with an upper rear portion of the rear mold board forming a generally frustoconical section, with the upper edge terminating in spaced relation above and behind the lower front edge, thus providing an open material receiving front portion and a closed rear material guiding and collecting portion with the inner edge being connected to the housing of the pumping unit and extending around the inlet opening thereof and conforming generally to the shape of the rear portion of the opening thereof, the outer edge defining a smaller diameter outer portion of the frusto-conical section and being connected to the side plate;

an elongated delivery conduit receiving the material from the pumping unit and transporting the same to a remote location; and

means for raising and lowering the boom structure to adjust the elevation of the first and second auger elements and the pumping unit.

4,104,814

CLEAN TOWEL PRESENTING MACHINE

Leonard A. Whight, Cornelie van Zantenstraat 296, The Hague, Netherlands

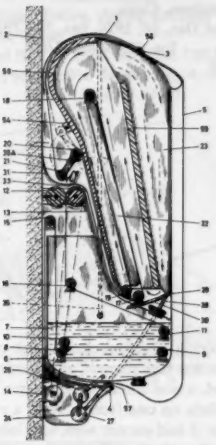
Filed Feb. 1, 1977, Ser. No. 764,891

Claims priority, application Netherlands, Feb. 2, 1976, 7601031

Int. Cl.[2] A47K *10/30*

U.S. Cl. 38—2 **7 Claims**

1. Automatic towel machine for cleaning, drying and gradually dispensing an endless web, comprising a substantially closed casing having at the front side a delivery slot and an intake slot for the web, said casing enclosing a web cleaning part, to be filled with cleaning liquid, a web drying part provided with at least one heating element, a condenser for condensing the vaporous cleaning agent, said condenser communicating with the cleaning part for the flow back of condensed cleaning agent to said cleaning part, and casing guide means for guiding the web from the intake slot through said cleaning part and said drying part to said delivery slot, said condenser being in an individual space separated from the drying part by a thermally insulating partition, said drying part and said condenser space communicating with each other at two spaced locations, said drying part and condenser being positioned above said cleaning part so that natural and/or forced circula-



tion of the vaporous cleaning agent may pass through the drying part, the condenser space and said communications.

4,104,815

STEAM IRON

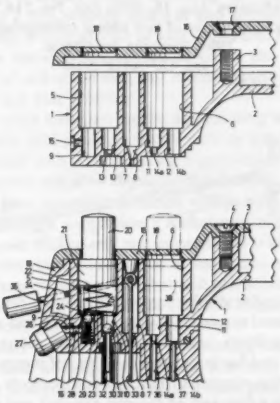
Urs Hammer, Oberbuchsiten, and Ernst Gisiger, Niederbuchsiten, both of Switzerland, assignors to Jura Elektroapparate-Fabriken L. Henzirohs A.G., Niederbuchsiten, Switzerland

Filed Nov. 11, 1977, Ser. No. 850,734

Claims priority, application Switzerland, Nov. 19, 1976, 14596/76

Int. Cl.[2] D06F *75/18*

U.S. Cl. 38—77.5 **5 Claims**



1. In a steam iron of the type having a water reservoir, a vaporization chamber, a handle, and two cylinders disposed in the portion of said handle situated nearest the front of said iron and including respective bottom portions situated nearest said water reservoir and respective top openings situated remote from said water reservoir, the improvement comprising:

a one-piece component including said cylinders and at least parts of said handle and

a cover element having two segments capable of being either selectively broken out of said cover element or of selectively sealing off said respective top openings of said two cylinders.

4,104,816

MULTI-FUNCTION LABEL AND CARRIER WEB

Charles Pingeton, Southbridge, Mass., assignor to Doring Labels, Inc., Danielson, Conn.

Filed Dec. 16, 1976, Ser. No. 751,316
Int. Cl.[2] A44C 3/00
U.S. Cl. 40—2 R 4 Claims

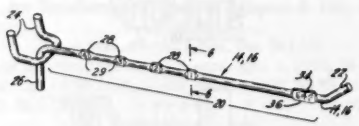
1. A multi-function label and carrier web comprising a label having indicia on one face thereof, an adhesive on the opposite face of said label, a non discardable carrier web having heat transferrable indicia on one face thereof, a release coating on the opposite face of said carrier web, said label being mounted on the carrier web with the adhesive face being superimposed on the release coating face of the web, whereby the label is adapted to be peeled from the carrier web and adhered to another surface, and the transferrable indicia is adapted to be transferred from the carrier web to yet another surface when heat is applied to the release coating face of the web, whereupon the carrier web may then be discarded.

4,104,817

INVENTORY-CONTROL MERCHANDISE DISPLAY APPARATUS

Milton W. Herzog, Valley Stream, N.Y., assignor to H. Goodman & Sons, Inc., Kearny, N.J.

Continuation of Ser. No. 580,560, May 27, 1975. This application Aug. 16, 1976, Ser. No. 714,703
The portion of the term of this patent subsequent to Dec. 13, 1994, has been disclaimed.
Int. Cl.[2] A47F 5/00
U.S. Cl. 40—19.5 3 Claims



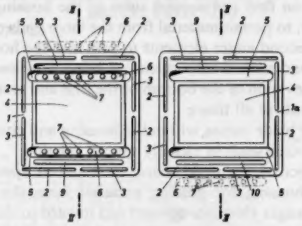
1. Merchandise display apparatus adapted for use in an inventory control system, including a support, and a metal rod of essentially uniform cross-section at least along most of its length, said rod having at one end thereof means for securing the rod to the support so that the rod projects in cantilever fashion with a free end of the rod exposed and said free end being no more than moderately larger transversely than the maximum transverse dimension of said essentially uniform cross-section of the rod for readily entering holes in a series of merchandise-bearing cards, said rod having plural swaged portions having facets and associated bumps distributed along the rod for providing a measure of the quantity of merchandise-bearing cards on the rod, any one or more of the facets and associated bumps that are not concealed by merchandise-bearing cards being readily recognized by feel in the course of taking inventory, said facets bearing a sequence of characters distributed along the rod the rod having rounded transitions between each bump and the adjoining portions of the rod for facilitating the movement of merchandise-bearing cards along the rod.

4,104,818

SLIDE FRAME

Heinrich Hrabik, Linz, Austria, assignor to Bonum-Werk Inh. Friedrich Hetzmannseder, Linz, Austria

Filed Nov. 26, 1976, Ser. No. 745,074
Claims priority, application Austria, Sep. 2, 1976, 6521/76
Int. Cl.[2] G09F 13/00
U.S. Cl. 40—152 4 Claims



1. A slide frame comprising

(a) two component frames each defining a rectangular window having two opposite parallel sides and including means for joining the two component frames together to form the slide frame, the windows registering in the joined component frames, and the two joined component frames being adapted to clamp a slide film therebetween, the slide film having perforations on opposite sides thereof and arranged to extend along the two opposite parallel sides of the registering windows, and the perforations having edges remote from the parallel sides of the registering windows,

(b) two film spreading bars arranged between the two joined component frames along the two opposite parallel sides of the registering windows for limited longitudinal displacement in the direction of said sides, each of the bars having teeth for interengaging with the perforations in the slide film and clamping the slide film between the component frames to hold the film in a plane, and

(c) means for holding the spreading bars between the component frames with their teeth engaging the remote edges of the film perforations whereby the film is held under tension between the component frames, the holding means comprising a recess along a respective one of the sides in one of the component frames for receiving a respective one of the spreading bars, the recess having a camming surface sloping away from the one side, and the one spreading bar having a camming surface cooperating with the camming surface of the recess whereby the one spreading bar is forced away from the one side when the two component frames are joined.

4,104,819

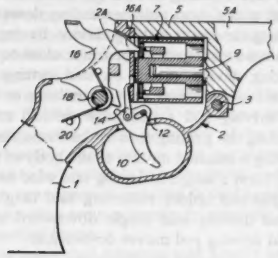
TOY WEAPON

Giampiero Ferri, Florence, Italy, assignor to Edison Giocattoli S.p.A., Florence, Italy

Filed Jun. 23, 1977, Ser. No. 809,401
Claims priority, application Italy, Jul. 13, 1976, 9519 A/76
Int. Cl.[2] F41C 3/06
U.S. Cl. 42—58 6 Claims

1. In a toy weapon for use with ammunition of disc-like form containing a plurality of explosive charges, means defining a rotary magazine cylinder for the ammunition, means for advancing the cylinder, a trigger, a hammer operated by the trigger, and means defining an anvil co-operating with the hammer to cause explosion of the charges, the cylinder being such that the ammunition can be positioned in any angular

orientation, the anvil comprising an assembly of points spaced one from another by a pitch smaller than that of the charges of the ammunition, and the hammer having a dimension in the



direction of spacing of the points of about three-quarters of the pitch of the charges, whereby one charge may be fired after advance of the magazine cylinder by a distance equal to the pitch of the charges.

4,104,820

FISH HOOKS

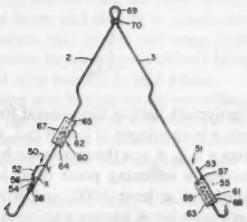
David Paul Bardebes, 12 Yatton St., Greerton, Tauranga, New Zealand

Filed May 5, 1976, Ser. No. 683,566

Claims priority, application New Zealand, Jan. 28, 1976, 179852

Int. Cl.[2] A01K *83/02*

U.S. Cl. 43—36 **5 Claims**



1. A fish-catching device, comprising at least two arms adapted to be biased towards each other and each having a main portion and an end portion which is turned back whereby a channel is defined between the end portion and the main portion, a plurality of fishhooks each having an eyelet at one end and a spike at the other end, the eyelets of the fishhooks being threaded over the end portions of the arms respectively and being received in the channels defined between the end portions and the main portions of the arms respectively, a plurality of elongate hook securing members mounted on the arms respectively and each formed with a hole having a horizontal component passing completely therethrough and a vertical component passing part way therethrough, the horizontal component being adapted to engage in a neat fit with the main portion and the end portion of the arm and the vertical component being adapted to engage with the eyelet of the fishhook, and actuating means adapted to cooperate with the arms such that in a first condition of the actuating means the arms are in a biassed condition and the spikes of the fishhooks are located close together whereas upon a desired force being applied to the spikes the actuating means actuate and the spikes of the fishhooks move apart.

4,104,821

TOY TELEPHONE WITH BELL AND RECORDED MESSAGES

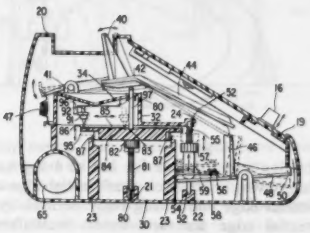
Takamitsu Nakajima, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Sep. 1, 1976, Ser. No. 719,530

Claims priority, application Japan, Sep. 4, 1975, 50-122677

Int. Cl.[2] A63H *36/30*

U.S. Cl. 46—33 **4 Claims**



1. A toy telephone, comprising:

a housing provided with a cradle;

a spindle, means operatively mounting said spindle within said housing for rotation and reciprocation, said spindle being provided with a first gear, a sound disc mounted on said spindle for rotation therewith, said sound disc being provided with at least one continuous groove, and a continuous rack of teeth along the periphery thereof;

a motor and a source of energy therefor mounted within said housing, and means operatively connecting said motor and said disc for rotating said disc;

a switch mounted to said housing and means connecting said switch with said motor and said source of energy;

a pick-up arm provided with a platform within which is mounted a stylus, means mounting said arm to rotate between a first position wherein said stylus is within the beginning of said groove of said sound disc and a second position wherein said stylus is within the end of said groove of said sound disc, and means normally urging said arm to said first position;

a speaker cone mounted within said housing and provided with a rib, said platform of said pick-up arm making sliding contact with said rib during movement of said pick-up arm betwen said first and second positions;

a second gear rotatably mounted within said housing and being provided with a cam, a rocker-arm, means normally urging said rocker-arm into engagement with said cam, a bell mounted to said rocker-arm, and means mounting said rocker-arm to rotate such that said bell moves between a first non-ringing position and a second ringing position as said second gear and cam are rotated;

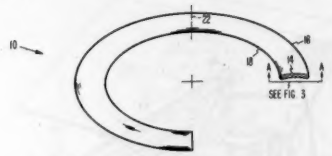
a third gear, means operatively mounting said third gear within said housing for rotation and reciprocation between a first position wherein said third gear engages said rack of teeth and a second position wherein said third gear is out of engagement with said rack of teeth, means attached to said third gear to ring said bell when said third gear is rotated and when said bell is in said second ringing position, means normally urging said third gear to said second position: and

means moving said sound disc out of engagement with said stylus of said pick-up arm permitting said pick-up arm to move to said first position, while simultaneously operatively connecting said first gear to said second gear, and means for moving said third gear to said first position operatively connecting said rack of teeth of said sound disc to said third gear.

4,104,822
ROTATING CIRCULAR AIRFOIL

Henry Wendell Rodgers, 9725 W. 21st Ave., Lakewood, Colo. 80215

Filed Dec. 3, 1976, Ser. No. 747,310
Int. Cl.[2] A63H 27/00
U.S. Cl. 46—74 D 14 Claims



1. A rotating aerial device for use as a toy comprising a circular ring having an outer circumferential edge and an inner circumferential edge and a ring body defined by said outer circumferential edge and said inner circumferential edge wherein said ring body comprises:

a. a circular airfoil having an upper camber surface and a bottom camber surface and a uniform cross-section throughout and;

b. at any cross-section of said airfoil said bottom camber surface is below a reference chord line extending across said cross-section from said outer circumferential edge to said inner circumferential edge; and

c. said upper camber surface is above said chord line having a maximum height from said chord line approximately equal distance between said outer circumferential edge and said inner circumferential edge; and

d. a first curvature of said upper camber from said maximum height to said outer circumferential edge substantially identical to a second curvature of said upper camber from said maximum height to said inner circumferential edge.

4,104,823
ARRANGEMENT FOR FIXING HOP GUIDING ROPES IN THE SOIL

Vladimir Jakl; Josef Cink, and Filip Bacovsky, all of Sumperk, Czechoslovakia, assignors to Vyzkumny ustav lykovych vlaken Sumperk and Strojni a traktorova stanice v Zatci, narodni podnik Zatec, both of Prague, Czechoslovakia

Filed Mar. 9, 1977, Ser. No. 775,845
Int. Cl.[2] A01G 17/04
U.S. Cl. 47—1 R 3 Claims

1. Apparatus for fixing guiding ropes in the soil comprising in combination:

a frame with an upper and a lower part, a number of generally vertical guiding rods on said frame, a bearing in the lower part of the frame, a support slidably mounted on said guiding rods, a driving rod rotatably supported in the upper part of the frame and passing through the bearing in the lower part thereof, a tongue and a holder provided at the lower end of the driving rod, a twisting device supported on the lower part of the frame and adapted for rotation coaxially with the driving rod, the driving rod engaging said twisting device for rotation therewith, a long point and a short point extending downwards from the twisting device, a cutting device having means for guiding a wire arranged on the frame close to the body of the twisting device, means on said cutting device for cutting said wire, means for transmitting to the support and the driving rod a generally vertical reciprocating motion along the guiding rods of the frame, and means for transmitting a rotating motion to the body of the twisting device to form a tangle including said wire on said points, said tongue and holder removing said tangle from said points and driving said tangle downward into the soil when said driving rod moves downward.

4,104,824
MULTIPHASE BLOCK AND GRAFT COPOLYMERS COMPRISING A HYDROPHILIC CONTINUOUS PHASE AND HYDROPHOBIC DOMAINS

Robert D. Lundberg, Somerville, and Neville G. Thame, Edison, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 553,613, Feb. 27, 1975, Pat. No. 4,057,598, which is a continuation of Ser. No. 327,831, Jan. 29, 1973, abandoned. This application Jan. 11, 1977, Ser. No. 758,421
Int. Cl.[2] A01C 1/04
U.S. Cl. 47—58 9 Claims

1. A method of promoting the survival and growth of plants which comprises admixing with the plant growth medium in which said plants are grown from about 25 weight percent of a thermoplastic copolymer having an average molecular weight of at least 10,000, selected from the group consisting of copolymers represented by graph copolymers having the general formula

$$\begin{matrix} B \\ | \\ [A]_m \end{matrix}$$

and block copolymers having the general formula xB—[AB]$_n$—yA wherein n is an integer ≥ 1, m is >1, x and y are 0 or 1, and y is 1 when n is 1, A is a thermoplastic hydrophobic polymer block having a softening point of at least 35° C and a molecular weight of at least 2,000, and B is a thermoplastic hydrophilic polymer block having a softening point of at least about 35° C and a molecular weight of at least about 6,000 and which comprises from about 30–97 weight % of said copolymer.

4,104,825
VENT

Stephen L. Hosmer, Englewood, Colo., assignor to Young Windows Inc., Conshohocken, Pa.

Filed Oct. 18, 1976, Ser. No. 733,430
Int. Cl.[2] E05F 11/00; E05D 7/00
U.S. Cl. 49—324 18 Claims

1. Improved vent means for a housing comprising;

an annular shaped mounting frame having mechanism for fixedly connecting the frame in an aperture of a housing, the mounting frame forming a passageway to provide for communication between the inside and outside of the housing;

an annular shaped vent frame carrying a closure;

hinge means disposed on one side of the mounting frame and having a guide section fixed to the mounting frame and a follower section fixed to the vent frame and the guide and follower being snugly, slidingly engaged and the mounting frame, the vent frame and the hinge means each being

symmetrically disposed with respect to a plane bisecting said one side;

said engagement between the guide section and follower section supporting the vent frame for rotation with respect to the mounting frame about an axis normal to said plane as between a closed position wherein the vent frame and closure close off said passageway to any of a plurality of open positions wherein the vent frame and closure open said passageway;

a continuous annular seal wall on the said mounting frame;

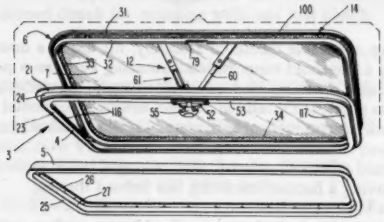
a continuous flexible seal on said vent frame and extending around adjacent the outer periphery of the vent frame;

a handle rotatably mounted on said mounting frame and positioned to be accessible from the interior of the housing when the vent means is installed in said aperture;

a pair of operating arms respectively rotatably mounted on said mounting frame;

drive means connected between said handle and said arms and providing that rotation of handle simultaneously rotates said arms in opposite directions;

a track on said vent frame;



each arm supporting a rider, the rider being mounted in said track and making a snug, sliding fit therewith and rotation of the operating arm moving the rider along the track to cause the vent frame and closure to rotate about the hinge means as between said closed and open positions and in the closed position the riders respectively being symmetrically disposed with respect to said plane;

each said operating arm having means providing for the arm to be rigid in the direction of arm rotation and flexible in a direction normal to the rotational direction;

in the closed position, said seal engaging said seal wall to form a water seal;

the riders and hinge means being disposed whereby in the closed position the riders and hinge means exert forces on the vent frame symmetrical with respect to said plane to cause said engagement between the seal and seal wall to be continuous and to prevent rattle of the vent frame; and

in any of said open positions said snug, sliding fit of the hinge means and of the riders supporting the vent frame to prevent rattle thereof.

4,104,826

DOOR ACTUATING SYSTEM

Thomas R. Wadford, 214 Osborne Ave., Baltimore, Md. 21228

Filed Mar. 28, 1977, Ser. No. 782,182

Int. Cl.[2] E05F *11/00*

U.S. Cl. 49—360 **10 Claims**

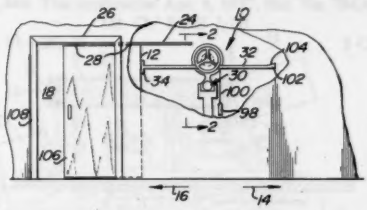
1. A door actuating system for reversibly displacing a door in a longitudinal direction, comprising:

(a) motor means;

(b) drive bar means secured to said door on a first end for displacement of said door responsive to actuation of said motor means;

(c) drive means being frictionally coupled to said drive bar means for displacing said drive bar means in a first longitudinal direction responsive to said actuation of said motor means, said drive means being rotationally actuatable about at least a first axis line and substantially stationary in said longitudinal direction; and,

(d) counterweight drive means being frictionally coupled to said drive means for displacing said drive bar means in a second longitudinal direction responsive to deactuation of



said motor means, said counterweight drive means being fixedly coupled to said drive means about said first axis line for rotational actuation of said counterweight drive means to store energy for said second longitudinal displacement of said drive bar means.

4,104,827

PIVOTING AND SLIDING WINDOW

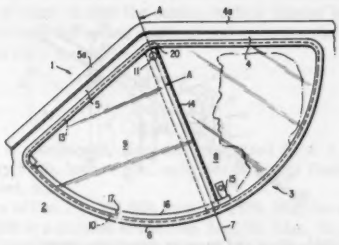
Robert Opron, Verrieres le Buisson; Philippe Bourguignon, Paris, and Claude Guelton, Maurepas, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 9, 1977, Ser. No. 767,159

Claims priority, application France, Feb. 11, 1976, 76 03716

Int. Cl.[2] E06D *7/00*; E06B *3/34*

U.S. Cl. 49—385 **11 Claims**



1. A window assembly, especially for automobile bodies, comprising a sliding glass window mounted in an automobile body, in the shape of a sector, wherein the window comprises first and second glass sectors connected by pivot means for movement of said first and said second glass sectors about a common axis situated in the angle formed by the junction of the straight sides of the sectors.

4,104,828

SOLID DOOR HAVING EDGES OF LAMINATED PRESSED WOOD FIBER SHEET MATERIAL

Edwin N. Naslund, and Ian MacDonald, both of Santa Rosa, Calif., assignors to Cal-Wood Door, Santa Rosa, Calif.

Filed May 26, 1977, Ser. No. 800,785

Int. Cl.[2] E04B *1/94*; B27K *3/18*

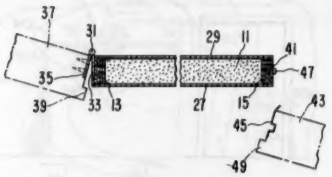
U.S. Cl. 49—399 **10 Claims**

1. A fire door, comprising:

a rectangularly shaped piece of core sheet material having a substantially uniform thickness and edges on all four sides thereof that are planar and perpendicular to major planar surfaces of said core,

wood strips attached to at least the opposing edges of said core that are of the longest length, the thickness of said

strips being substantially the same as the thickness of the core material, said strip being formed of a plurality of layers of sheet material of uniform thickness that are adhered to one another and to the edge of the core material in a manner that the surfaces of the sheet material are oriented parallel to the edge surface of the core to which



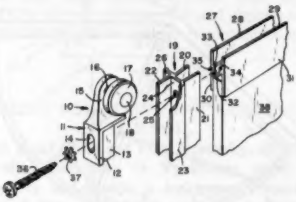
it is attached, said sheet material being formed from a slurry mixture of individual wood fibers and a fire retardant chemical through the use of heat and pressure, and facing sheet material attached to the major surfaces of said core material as extended by said wood strips, thereby to form continuous aesthetically pleasing surfaces on either side.

4,104,829

ROLLER AND HANGER ASSEMBLY FOR BY-PASS DOORS

Clarito R. Agcaoili, Glendale Heights, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed May 31, 1977, Ser. No. 801,720
Int. Cl.[2] E05D *13/02*
U.S. Cl. 49—409 **1 Claim**



1. A slidable door and support structure comprising in combination:

(a) a supporting structure including a track,

(b) a door comprising a frame having a panel engaged therein,

(c) a pair of hanger and roller assemblies mounted one at each end of said door, each of said hangers comprising a shank recessed to define an insert member and a flange, said insert member and flange having an elongate slot provided therein and a trunnion at the end thereof having said roller rotatably mounted thereon and each of said rollers engaged by said track, and

(d) a retaining screw positioned within the elongate slot of said insert member and flange,

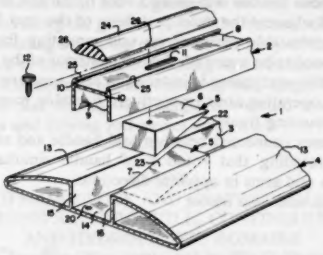
and wherein said frame comprises a side frame member H-form in cross-section having a pair of channels one in which said insert member is disposed, the edges of said channel engaging the flange of said shank, and the other channel engaging a panel of said door, wherein said side frame member has an aperture therein to permit said retaining screw to pass therethrough, and wherein said frame further comprises a top frame member provided with a channel for receiving said panel, and is further provided with means defining a screw-engaging channel receiving and engaging said retaining screw in self-tapping engagement, whereby said retaining screw may be loosened to permit said hanger to be raised or lowered with respect to said frame to maintain said hanger and said frame in the proper position in relation to each other.

4,104,830

ADJUSTABLE THRESHOLD

Fred Eagle, 905 W. 93rd Ter., Kansas City, Mo. 64114

Filed Jul. 11, 1977, Ser. No. 814,531
Int. Cl.[2] E06B *1/70*
U.S. Cl. 49—468 **8 Claims**



1. An adjustable threshold assembly, for use in a doorway having a threshold support base extending between a pair of door frame members, said threshold assembly comprising:

(a) an elongated threshold member having a horizontal wall, said threshold member mounted on said threshold support base;

(b) said threshold member wall having a lower surface and having a fastener receiving slot formed therein;

(c) a loosenable fastener;

(d) a top block having an inclined lower surface, said top block being removably and adjustably fastened to the lower surface of said threshold member wall by receiving said fastener through said slot; and

(e) a bottom block having an inclined upper surface of substantially equal inclination to said top block lower surface, said bottom block being fixed to said threshold support base with said bottom block upper inclined surface abutting said top block lower inclined surface, whereby horizontal translation of said top block varies the height of said threshold member relative to said threshold support base.

4,104,831

AUTOMATIC CENTRIFUGAL BARREL FINISHING MACHINE

Hisamine Kobayashi, Nagoya, Japan, assignor to Kabushiki Kaisha Shikishima Tipton, Nagoya, Japan

Filed Aug. 1, 1977, Ser. No. 820,940
Int. Cl.[2] B24B *31/04*
U.S. Cl. 51—164 A **19 Claims**

1. An automatic centrifugal barrel finishing machine of the type including a turret capable of rotating on its vertical central shaft with a high speed and carrying a plurality of barrels open at top containing therein workpieces to be treated and treating media for treatments such as surface finishing, milling, deburring, stirring, chemical processing and the like, wherein the improvement comprises:

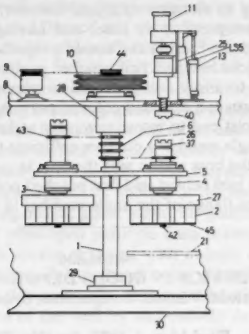
a housing;

a plurality of barrel holding plates connected to the turret rotatably and revolvably relative to the turret shaft, for holding the barrels tightly thereunder to keep the same airtight or watertight;

dual rotary shaft structure carrying said barrel holding plates therethrough, said structure comprising an outer hollow shaft for driven connection with said turret central shaft and an inner shaft having chuck means at a lower end thereof;

barrel supporting bottom plate for carrying barrels thereon,

having a central barrel mounting shaft therethrough disengageably to be held by said chuck means; and



a pair of clutch means including a first clutch connected to the other upper end of said inner shaft and a fluid-operated second clutch for engaging with said first clutch.

4,104,832

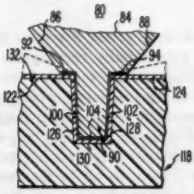
METHOD FOR FORMING KEEL-TIPPED STYLUS FOR VIDEO DISC SYSTEMS

Eugene Orville Keizer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 25, 1977, Ser. No. 781,302

Int. Cl.² B24B *1/00*

U.S. Cl. 51—281 R **8 Claims**



1. A method of fabricating a keel-tipped stylus by modifying a tapering support element having a tip which is defined by a prow and a substantially flat V-shaped rear surface remote from said prow; said keel-tipped stylus being suitable for playing back prerecorded signals from a disc record groove of a given width and a given pitch; said method comprising the steps of:

introducing said tip of said tapering support element in an abrasive groove having a bottom wall, substantially parallel side walls separated by a distance less than said given width and lands extending away from said side walls; while

establishing relative motion between said tapering support element and said abrasive groove along a line which is disposed in a plane substantially perpendicular to said V-shaped rear surface while holding said tapering support element in a relatively fixed orientation with respect to said abrasive groove;

said side walls of said abrasive groove forming side surfaces of a fore-and-aft constricted terminal portion of said tapering support element;

said lands of said abrasive groove forming shoulders interconnecting said constricted terminal portion with remainder of said tapering support element; and

terminating said relative motion when said constricted terminal portion reaches a given height.

4,104,833

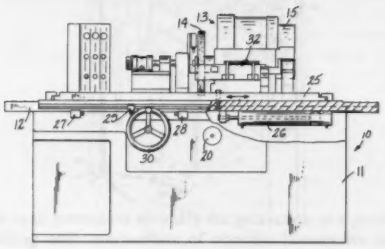
GRINDING METHOD

John J. Glowacki, Orange, Conn., assignor to Glowacki Associates, North Branford, Conn.

Continuation of Ser. No. 568,377, Apr. 15, 1975, abandoned, which is a division of Ser. No. 386,835, Aug. 5, 1973, Pat. No. 3,975,864. This application Apr. 4, 1977, Ser. No. 784,419

Int. Cl.² B24B *1/00*

U.S. Cl. 51—281 R **5 Claims**



1. The method of repetitively removing a predetermined dimension of material from successive work where the work dresses a grinding wheel and reduces the diameter thereof and the grinding wheel removes the material from the work in successive traverses comprising the steps of infeeding the grinding wheel from a known position of the cutting surface thereof in predetermined increments while relatively moving the work past the cutting surface, sensing when the cutting surface has been infed to a predetermined position and halting infeed of said wheel at the sensed predetermined position, retracting said wheel a fixed predetermined distance from the sensed position so that the cutting surface thereof is a known distance from the sensed position, and repeating the foregoing steps on each new work.

4,104,834

FIRE VENT

Joseph R. Anghinetti, Kennebunkport, and Paul A. Couture, Emery Mills, both of Me., assignors to Wasco Products, Inc., Sanford, Me.

Division of Ser. No. 531,808, Dec. 11, 1974, Pat. No. 4,068,417, which is a division of Ser. No. 341,780, Mar. 15, 1973, abandoned. This application Sep. 27, 1976, Ser. No. 726,578

Int. Cl.² L05F *15/20*

U.S. Cl. 52—1 **8 Claims**

1. A system for venting a building having a plurality of floors, said system comprising;

a first vent disposed at one floor of the building and including a fixed frame, a movable frame adapted to fit within the fixed frame when in a closed position and panel means for insertion into said movable frame,

means for pivotally securing said movable frame to said fixed frame,

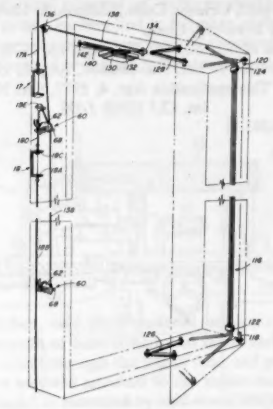
means for urging said movable frame to an open position,

latch means for maintaining said movable frame in the closed position,

a first release member mounted on the fixed frame of said first vent for releasing the latch means of the first vent to permit the movable frame to move to its open position,

another vent disposed at another floor of the building and including a fixed frame, a movable frame adapted to fit within the fixed frame when in a closed position, panel means for insertion into said movable frame, means for pivotally securing said movable frame to said fixed frame, means for urging said movable frame to an open position, and a latch means for maintaining said movable frame in the closed position,

and a second release member mounted on the fixed frame of said first vent,



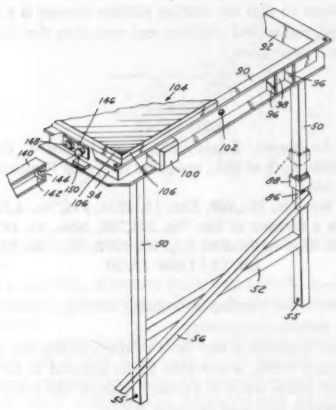
and means coupling from the second release member of the first vent to the said another vent for releasing the latch means of the said another vent.

4,104,835

PORTABLE STAGING EQUIPMENT

John Bardwick, III, Ypsilanti, Mich., assignor to Aztec Staging Co., Inc., Ann Arbor, Mich.

Filed Mar. 24, 1977, Ser. No. 780,703
Int. Cl.[2] E04H *3/28*
U.S. Cl. 52—7 **4 Claims**



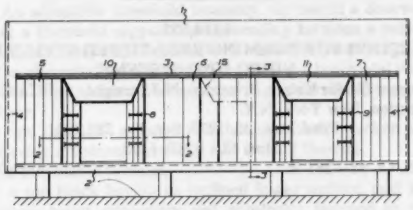
1. A portable stage system which comprises:
(a) a plurality of first floor panels,
(b) stanchions movable to a position to support each of said first floor panels,
(c) means on opposite sides of said first floor panels to interengage to effect interlock of a plurality of said first floor panels on said sides in spaced aligned rows,
(d) spacer joists to lie horizontally between said spaced aligned rows in interlocking engagement with said first floor panels,
(e) a plurality of second floor panels supported on said joists to fill the space between said aligned rows to provide a continuous floor surface,
(f) said first floor panels comprising a rectangular frame of U-shaped angle members, the flanges facing outward, and a flat panel lying atop said frame and secured thereto,
(g) a bossed projection mounted between said flanges on the base of the U-shaped angle members,
(h) a joist to cooperate with said flanges and said boss comprising an elongate structural member,
(i) a cross-piece at an outer end having a slot to engage behind the head of the bossed projection,
(j) said joist having a first notched portion below said cross-piece to allow said joist end to move transversely over said boss and a second notched portion at the top to allow said joist end to move upwardly under the top flange of the angle member a distance sufficient to allow movement over the boss and to seat the boss in said slot, the bottom of the joist behind said first notched portion resting on the bottom flange of the angle member in assembly.

4,104,836

DOOR DEVICE IN GOODS DEPOTS OR THE LIKE

Torsten Waloddi Weibull, Torapmöllan, Brösarp, Sweden (S-270 44)

Filed Mar. 2, 1977, Ser. No. 773,742
Claims priority, application Sweden, Mar. 3, 1976, 7602972
Int. Cl.[2] E04B *1/343;* E06B *3/94*
U.S. Cl. 52—64 **4 Claims**



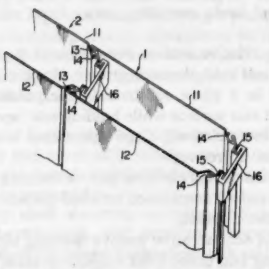
1. A door device in a goods depot or the like, the door device covering a substantially rectangular passage into the depot and comprising a frame intended for a door and wall portions connected to the frame and arranged on either side of the frame in the passage, wherein said frame is horizontally shiftable along said passage, and wherein the wall portions connected to said frame are disposed, irrespective of the shifting position of the frame, to cover portions of the passage located on either side of the frame.

4,104,837

WALL CONSTRUCTING METHOD AND WALL CONSTRUCTED THEREBY

Han-Ichiro Naito, 15-1002, Wakaba-1-chome, Shinjuku-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 750,042, Dec. 13, 1976, abandoned. This application Jul. 27, 1977, Ser. No. 819,650
Int. Cl.[2] E04C *2/08;* E04B *1/82;* E06B *3/12*
U.S. Cl. 52—173 R **12 Claims**



1. A wall comprising a plurality of partition units each including a pair of wall surface forming members of small thick-

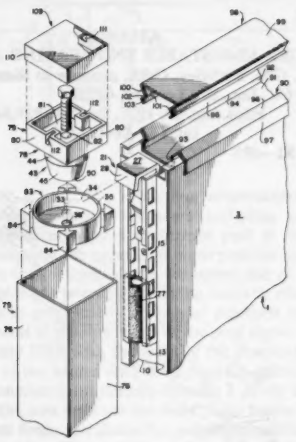
ness disposed opposite each other with a predetermined distance therebetween to provide partition wall surfaces, connecting means including at least one connecting member for connecting said wall surface forming members together by engaging with one end thereof and normally urging the other non-connected ends of said wall surface forming members toward each other in a closing direction, each of said wall surface forming members being formed adjacent to both ends thereof with engaging means engageable with similar engaging means of mating shape formed adjacent to the associated ends of the adjoining wall surface forming member when joined together, each of said partition units being adapted to be telescoped into the internal space of another at the end provided with said connecting means, guide means for guiding drawing movement of said telescoped partition units drawn one after another, said guide means engaging with at least one end of said partition units parallel to the drawing direction of said partition units to determine the drawing direction thereof during construction of the wall by successively drawing said telescoped partition units.

4,104,838

PORTABLE WALL ASSEMBLY

C. Herbert Hage, Poland, Ohio; Robert J. Welch, West Chicago, Ill., and Gabriel Goulish, Youngstown, Ohio, assignors to GF Business Equipment, Inc., Youngstown, Ohio

Filed May 17, 1977, Ser. No. 797,628
Int. Cl.² E04H *1/00*
U.S. Cl. 52—239 **19 Claims**



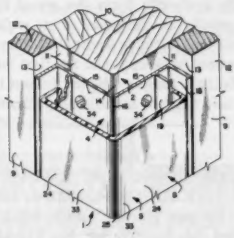
1. A portable wall assembly including, a panel having a vertical end edge, an upright post disposed adjacent said panel end edge for supporting said panel and having an inner cavity at both ends, an edge channel attached to said panel end edge, top and bottom mounting clips each having a mounting leg insertable in the top and bottom of said channel respectively, an arm projecting outwardly from each said clip mounting leg and overlying the respective ends of said post, a tongue extending from each said clip arm into said post cavity, and retainer means releasably attached to both ends of said post and including means overlying said clip arms to secure said clip tongues within said post cavities, wherein, said top clip leg is affixed to said edge channel and said bottom clip leg is loosely disposed within said edge channel and maintained therein by said retainer overlying means.

4,104,839

WALL PROTECTION ASSEMBLY

Claude P. Balzer, and Edward M. Corman, both of Wichita, Kans., assignors to Balco, Inc., Wichita, Kans.

Filed Jul. 28, 1977, Ser. No. 819,718
Int. Cl.² E04F *13/06, 19/02*
U.S. Cl. 52—288 **13 Claims**



1. A wall protection assembly for protection of a portion of a building wall intermediate of opposite boundaries thereof from damage resulting from impacts thereto comprising:

(a) an elongated, semi-resilient guard member having wall means and opposite side edges;

(b) longitudinally extending side members on each of said side edges and projecting inwardly therefrom with each having a laterally outward surface;

(c) an elongated base member having walls substantially conforming to the shape of the building wall portion to be protected and having side margins, said base member having outwardly projecting abutment members at each side margin with each having a laterally inward surface engaged by the respective lateral outward surface of the side members of the guard member for confining engagement of said guard member side members, said guard member wall means between the side members being in spaced overlying relation to said said base member walls;

(d) outwardly extending ribs on said base member walls and having shoulders facing the base member walls and spaced laterally inwardly from said abutment members; and

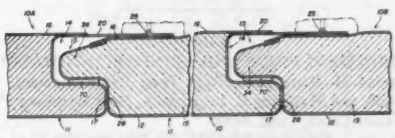
(e) resilient flange means on said guard member adjacent each side member thereof with each said flange having an edge engaging the shoulder of the respective adjacent rib for retaining said guard member positioned on said base member with the side members of said guard member engaging respective abutment members of said base member and resisting lateral translation of said guard member relative to said abutment members on said base member.

4,104,840

METAL BUILDING PANEL

Dennis Ronald Heintz, Oak Creek, and Arthur Bertram Thelen, Brookfield, both of Wis., assignors to INRYCO, Inc., Melrose Park, Ill.

Filed Jan. 10, 1977, Ser. No. 758,015
Int. Cl.² E04C *2/36*
U.S. Cl. 52—309.9 **10 Claims**



1. A face panel having a sheet metal skin forming a front wall and male and female longitudinal side edges thereon and having an insulating core,

a groove at the female side edge having opposing walls parallel to the panel front wall, with one groove wall and

the panel front wall portion adjacent thereto but spaced therefrom defining a tongue which ends at the top of the groove wall, and with the other groove wall constituting a sheet metal layer extending straight outwardly substantially beyond the groove top as a panel female side edge extension, said extension being parallel to the panel front wall, and

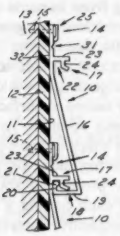
the male side edge having a longitudinal wall which projects first laterally inwardly from the panel front wall, then forwardly parallel to the panel front wall, then laterally inwardly and then extends slantedly backwardly to terminate at the panel back opposite the first lateral projection thereby defining a tongue adapted to nest in the groove at the female side edge of an adjoining identical panel.

4,104,841

ROOFING OR SIDING SLAT ASSEMBLY WITH PROTECTIVE HINGE-FORMING GROOVE

Paul Naz, 20502 Harper, Harper Woods, Mich. 48225

Filed Jul. 7, 1977, Ser. No. 813,444
Int. Cl.[2] E04D *1/00*
U.S. Cl. 52—519 **10 Claims**



1. An interlocking slat assembly for use as siding, roofing, and the like to cover surface areas of a building comprising:

a generally rectangular surface-covering panel;

an anchoring configuration adjacent an upper end portion of said panel;

a fastening tab adjacent said anchoring configuration and adapted to be secured to said building surface by fastening elements or the like passing therethrough;

a generally hook-like means integral with a lower portion of said panel for operatively engaging the anchoring configuration of a previously installed slat assembly for interlockingly positioning the slat assemblies one above the other in a partially overlapping manner; and

means for interconnecting said anchoring configuration and said fastening tab and integral therewith, said interconnecting means formed of a resilient material capable of deforming in the manner of a hinge and including a lateral groove of reduced thickness relative to the thickness of said anchoring configuration for establishing a hinge-type joint between said fastening tab and said panel to isolate said panel from the effects of distortions in said fastening tab and in said building surface such as may be caused when excessive force is applied to the fastening elements securing said fastening tab to said building surface.

4,104,842

BUILDING FORM AND REINFORCING MATRIX

Raymond H. Rockstead, 10041 Tesla Rd., Livermore, Calif. 94550, and Wolfgang B. Fahrenbach, 3064 Rossmoor Pkwy., Walnut Creek, Calif. 94595

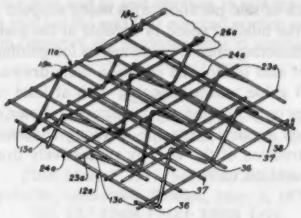
Filed Feb. 25, 1977, Ser. No. 771,999
Int. Cl.[2] E04H *12/00*
U.S. Cl. 52—650 **5 Claims**

1. A building form and reinforcing matrix comprising:

a pair of wire mesh sections having a plurality of substantially parallel longitudinally extending wires bonded to a plurality of substantially parallel transversely extending wires;

a plurality of sinuous wire truss members extending between and secured to and supporting said sections in spaced-apart substantially parallel planes, said truss members running generally longitudinally of said sections and being spaced apart transversely of said sections;

said truss members having angularly related sides joined in apexes with said sides mounted upon and bonded to the longitudinal wires of one of said sections at positions



spaced from their connected apexes to provide an outward projection of said apexes from said longitudinal wires in a rigid triangular structure;

the joinder of said transverse wires to said longitudinal wires being at positions spaced from the joinders of said truss members to said longitudinal wires, thereby spacing said apexes from any transversely extending wires; and

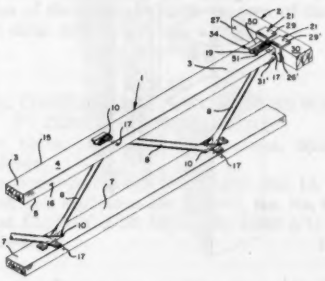
said truss members being positioned so that the apexes of transversely adjacent truss members are offset longitudinally from each other.

4,104,843

HANGER ADJUSTABLE END BEARING ASSEMBLY

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Aug. 29, 1977, Ser. No. 828,544
Int. Cl.[2] E04C *3/02*
U.S. Cl. 52—693 **4 Claims**



1. A hanger end bearing assembly for connecting the end of a composite light series truss to an end support; said truss includes a top chord consisting of a single lumber member having upper and lower faces; a lower chord, a plurality of metal web members extending between said upper and lower chords each having an opening formed in their ends; said upper chord is formed with a plurality of slots spaced along the length thereof which extend through said lower face; said chord is formed with a plurality of cross bores extending from the inner faces of said slots outwardly toward said chord edges; and a plurality of elongated pin members dimensioned for extending through said openings in said web members, and into said cross bores in said chords; said hanger assembly comprising:

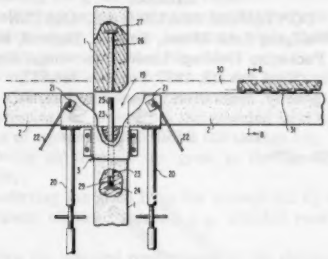
a. the end slots in said upper chord extend to the ends of said top chord;
b. a pair of sheet metal members placed in side by side relation each having:
1. a generally planar side member mounted substantially vertically and extending into said end slots and formed with an opening therethrough for registration with said cross bores in said chord for receipt of said pin;
2. a back flange integrally connected to substantially the entire length of said side member and positioned at a generally right angle to said side member and adapted for connection to said end support;
3. a top flange integrally connected to substantially the entire length of said back flange and positioned at a generally right angle to said back flange and side member and adapted for connection to said end support; and
c. each of said pair of sheet metal members is formed with a tab member integrally connected to said side member and positioned at right angles thereto and parallel to said top member.

4,104,844

METHOD OF ERECTING A BUILDING CONSTRUCTION

Robert O. Brownlee, Knoxville, Tenn., assignor to William Clinton Reid, Lucedale, Miss. and Robert O. Brownlee, Knoxville, Tenn.

Filed Sep. 6, 1973, Ser. No. 394,771
Int. Cl.[2] E04G *21/00*; E04B *1/16*
U.S. Cl. 52—744 **1 Claim**



1. A method of erecting a building construction of preformed concrete structural members including posts and beams, comprising erecting a preformed post in an upright position, surrounding the upper end portion of the post with a concrete form that extends above the upper end of the post, said form including a laterally extending bracket, placing preformed beams in substantially horizontal positions with inner ends of the beams at the upper end of the post above the latter and substantially flush with the walls of the post and embracing said ends of the beams with the upwardly extending portions of the concrete form thereby forming a cavity above the upper end of the post between the ends of the beams enclosed by the concrete form, and thereafter pouring concrete into the cavity between the adjacent ends of the post and beams and creating with the post and beams a monolithic structure; and extending a guy connection downwardly from the bracket at an angle to the post during the setting of the concrete.

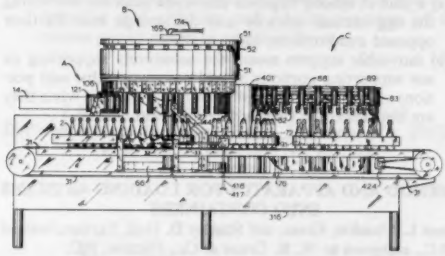
4,104,845

METHOD AND APPARATUS FOR APPLYING SLEEVES TO NECKS OF BOTTLES AND OTHER CONTAINERS

Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Continuation-in-part of Ser. No. 471,965, May 21, 1974, abandoned. This application May 28, 1976, Ser. No. 690,943
Int. Cl.[2] B65B *21/24*; B67B *5/00*
U.S. Cl. 53—14 **34 Claims**

1. Apparatus for applying sleeves to the neck portions of containers each having a body portion and a neck portion tapering upwardly from the junction of the neck and body, the neck having a lesser diameter than the body, comprising:
(a) at least one cylindrical mandrel supported for rotation about its cylindrical axis and with one end free, said mandrel having an outside diameter substantially less than the diameter of the body portion of the container but sufficient to allow a sleeve formed by wrapping a sleeve material about the mandrel to fit over the neck of the container,
(b) means for rotating the mandrel about its cylindrical axis,
(c) means for applying one end of a segment of flexible sleeve material to the rotating mandrel,



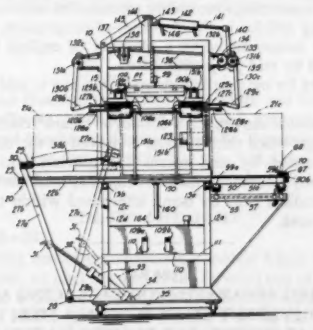
(d) means for then relesably adhering the segment to the rotating mandrel whereby the segment is rolled into a tube about the mandrel,
(e) means for supporting a container in axial alignment with the mandrel with the upper end of its non-cylindrical portion close to but spaced from the free end of the mandrel,
(f) said means (c), (d) and (e) being so arranged that said tube is spaced from the upper end of the container and so that the mandrel is at all times spaced from the upper end of the container, and
(g) means for sliding the aforesaid tube off of the mandrel and onto the container.

4,104,846

CONTAINER LOADING MACHINE AND PROCESS

John G. Waller, 140 Old Fairburn Close, SW., Atlanta, Ga. 30331

Filed Dec. 1, 1976, Ser. No. 746,412
Int. Cl.[2] B65B *5/10, 35/44*
U.S. Cl. 53—26 **17 Claims**



11. In an apparatus for stacking cartons of eggs of the type in which each egg carton contains a pair of spaced downwardly opening recesses defined by the sides of the downwardly protruding egg receiving cells and downwardly opening troughs between adjacent egg receiving cells outwardly of each recess, the combination of:

(a) a pair of spaced upstanding rods moveable axially in vertical paths, said rods being spaced apart by a distance approximately equal to the distance between said recesses of said egg cartons, means on said upstanding rods for supporting said cartons by respectively receiving the recesses of the cartons on the ends of said rods; and

(b) means for depositing said egg cartons onto the ends of said rods.

12. In an apparatus for stacking egg cartons of the type wherein the egg cartons are accumulated into successive layers in a storage zone and then successively stacked on each other, the combination therewith of:

(a) a pair of spaced opposed conveyor belts for conveying the egg cartons sidewise into the storage zone by their opposed end portions; and

(b) moveable support means for selectively supporting or not supporting portions of said conveyor belts, said portions of said belts being sufficiently flexible that when they are not supported they will release said cartons.

4,104,847

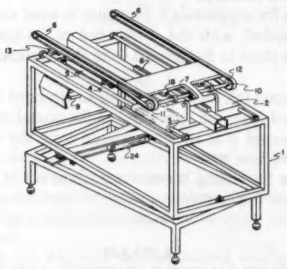
METHOD AND APPARATUS FOR LOADING ARTICLES INTO CONTAINERS

James L. Glandon, Greer, and Stanley D. Hall, Taylors, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Aug. 27, 1976, Ser. No. 718,259

Int. Cl.[2] B65B *5/04, 67/04*

U.S. Cl. 53—35 **12 Claims**



1. An apparatus for moving articles in a direction of progression toward and into a container, said apparatus comprising:

(a) a platform;

(b) a carriage moveably mounted on said platform, said carriage including a plurality of spaced apart projections;

(c) conveyor means moveably mounted on said carriage for moving articles in the direction of progression, said conveyor means including a plurality of endless belts supported by said projections;

(d) means for moving said carriage relative to said platform; and

(e) means for moving said conveyor means relative to said carriage when said carriage is moved in the direction of progression by said means for moving said carriage, whereby a container may be draped around less than all of said endless belts by being interposed within the spaced apart area.

4,104,848

PACKAGING APPARATUS FOR PACKAGING ARTICLES OF DIFFERENT KINDS WITHIN A FILM OF A HEAT-SHRINKABLE PLASTIC MATERIAL

Francesco Torre, Via Bascheris, Dalmine, Bergamo, Italy

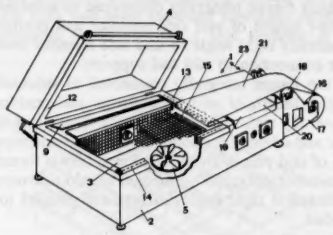
Filed Feb. 14, 1977, Ser. No. 768,319

Claims priority, application Italy, Mar. 3, 1976, 2913 A/76

Int. Cl.[2] B65B *53/02*

U.S. Cl. 53—184 S **4 Claims**

1. Apparatus for packaging articles within a film of heat-shrinkable plastic material comprising a housing; means within said housing defining a welding and shrinking chamber; a detachable cover for closing said chamber; means defining a heating box within said chamber; electrical resistance heating means within said heating box; at least one welding blade positioned in the area of said chamber engaged by said cover when said chamber is closed by said cover; a first control



member responsive to closing and opening of said chamber by said cover for energizing and deenergizing said heating means; a second control member responsive to closing of said chamber by said cover for opening said heating box upon closing of said cover; and means for feeding heat-shrinkable film within said apparatus.

4,104,849

CONTAINER SEALING APPARATUS

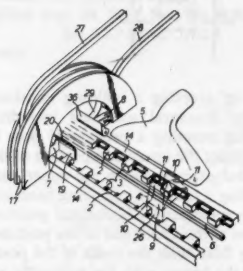
Richard Wolfgang Emil Mosse, London, England, assignor to Liquid Packaging Holdings Limited, Stevenage, England

Filed Feb. 15, 1977, Ser. No. 768,887

Claims priority, application United Kingdom, Feb. 16, 1976, 6044/76

Int. Cl.[2] B65B *7/18, 51/14*

U.S. Cl. 53—379 **12 Claims**



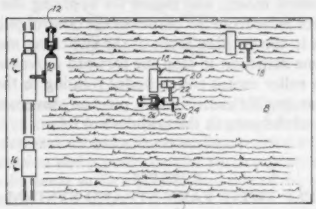
1. An apparatus for sealing a container having thermoplastic internal surfaces, comprising: advancing means for advancing said container along a path through a heating station; a panel-turning station and a sealing station; heating means situated at said heating station for heating said internal surfaces to at least a tacky consistency; panel-turning means situated at said panel-turning station being displaceable transversely of said path to bring the hot thermoplastic internal surfaces adjacent to each other while the container is stationary, said panel-turning means being turnable about respective fold axes of said panels; mounting means at said panel-turning station spaced unilaterally from the respective axes and mounting said panel-turning means for turning about the respective axes, said mounting means comprising first and second arcuate slide-in-slot arrangements concentric with said fold axes, and cooled clamping means situated at said sealing station for clamping adjacent hot thermoplastic internal surfaces together to seal said container while the container is stationary; said panel-turning

means being defined by first and second panel-turning members mounted by said respective slide-in-slot arrangements.

4,104,850
METHOD OF HARVESTING AND TRANSPORTING GRAIN

Harold D. Harris, Lubbock, Tex., assignor to Harris and Thrush Manufacturing Company, Lubbock, Tex.

Filed Aug. 30, 1976, Ser. No. 718,903
Int. Cl.[2] A01D *91/00*
U.S. Cl. 56—1 **6 Claims**

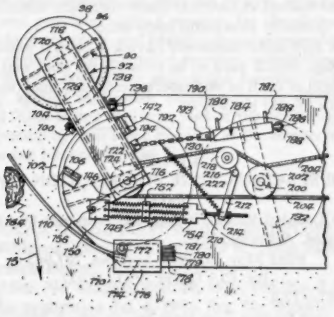


1. The method of harvesting and moving grain from a harvester to an elevator comprisng:
(a) harvesting the grain with a harvester, and
(b) collecting the grain in the harvester,
(c) transferring the grain to a wheeled field vehicle which is
(d) moving along side the harvester while the harvester continues to harvest the grain,
(e) moving the field vehicle to a storage bin located at the field wherein the grain is grown,
(f) transferring the grain from the wheeled field vehicle by means of equipment thereon to the storage bin,
(g) blowing air through the grain in the bin while it is therein,
(h) transferring the grain from the storage bin by means of equipment mounted thereon to a wheeled road vehicle, and
(i) moving the wheeled road vehicle to the elevator.

4,104,851
MOWING MACHINE

James L. Perry, 4025 Hartland Rd., Gasport, N.Y. 14067

Filed Aug. 4, 1976, Ser. No. 711,552
Int. Cl.[2] A01D *75/18, 55/18*
U.S. Cl. 56—10.4 **16 Claims**

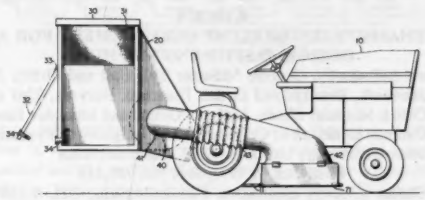


1. In a mowing machine comprising a frame movable along a land surface, mowing blade means carried by said frame and drive means carried by said frame and operatively connected to said mowing blade means:
a. support arm means movably connected adjacent one end to said frame and extending outwardly therefrom;
b. additional blade means carried by said arm means and operatively connected to said blade drive means;
biasing means holding said arm means in a first position;
d. motive power means carried by said frame and operatively coupled to said arm means for moving said arm means to move said additional blade means around obstacles such as plants, trees, posts and the like; and
e. control means operatively connected to said motive power means for controlling operation of said power means, said control means comprising sensing means for detecting said obstacles and causing operation of said motive power means in response thereto.

4,104,852
LAWN CLIPPING VACUUM COLLECTOR

DeForest Tackett, P.O. Box EG-891, Melbourne, Fla. 32935

Filed Nov. 8, 1976, Ser. No. 739,733
Int. Cl.[2] A01D *35/22*
U.S. Cl. 56—202 **12 Claims**



1. An vacuum loading organic refuse collector attachment for a tractor lawn mower of the type incorporated a driven, shaft supported rotary blade contained within a housing and a rear hitch mounting plate, comprising:
a refuse collection bin;
a mounting bracket affixed to said refuse collection bin and adapted to be rigidly secured to said tractor, said mounting bracket adapted to support said refuse collection bin suspended above ground level;
a blower housing incorporated in said mounting bracket;
an impeller contained within said blower housing; a power transmission adapted to couple rotary energy from said driven rotary lawn mower blade shaft to said impeller; and
a duct coupling said lawn mower blade housing to said refuse collection bin via said blower housing.

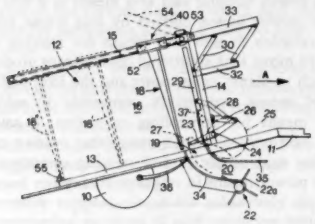
4,104,853
HAY BALER

John Arthur Howard; Bryce Ernest Randall, and David Hugh Fleming-Brown, all of Bury St. Edmunds, England, assignors to Howard Machinery Limited, Bury St. Edmunds, England

Filed Oct. 12, 1976, Ser. No. 731,636
Claims priority, application United Kingdom, Oct. 28, 1975, 44471/75
Int. Cl.[2] A01D *39/00*
U.S. Cl. 56—341 **15 Claims**

1. A baling machine comprising a mobile frame defining a bale chamber, an inlet opening at the forward end of the lower wall of the chamber, feed means for picking material to be baled from off the ground and feeding it to the inlet opening, an outlet opening at the rear end of the bale chamber through which a completed bale is discharged onto the ground while the machine is traveling, and restraining means constituting a rearward part of the bale chamber and movable between a first position in which the bale chamber is able to accept a relatively small quantity of the material and a second position in which the bale chamber is filled with the material, the restraining means offering a resistance to the movement between the first

and second positions so that material entering the chamber is compressed in the chamber, and such movement resulting in an enlargement of the bale chamber space to be occupied by the



material, the restraining means on reaching the second position being movable out of the path of the baled material to enable the completed bale to be discharged through the outlet opening.

4,104,854

DYNAMIC YARN-BRAKING ARRANGEMENT FOR AN OPEN-END SPINNING MACHINE

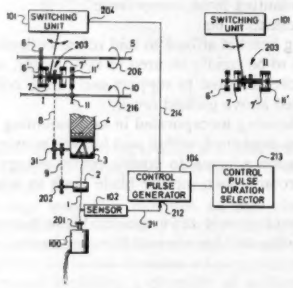
Karel Mikulecky, Chocen; Miloslav Tyl, Usti nad Orlici; Jan Janousek, Brandys nad Orlici; Frantisek Burysek, Usti nad Orlici; Stanislav Skoda, Usti nad Orlici, and Stanislav Esner, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 7, 1976, Ser. No. 730,416

Claims priority, application Czechoslovakia, Oct. 7, 1975, 6778/75

Int. Cl.[2] D01H *15/00, 13/16*

U.S. Cl. 57—34 R **2 Claims**



1. In an open-end spinning machine, a spinning chamber, a withdrawal tube extending downstream from the spinning chamber, first reversible draw-off roller means for normally withdrawing spun yarn from the chamber through the withdrawal tube, a take-up bobbin, a reversible yarn-distributing cylinder disposed in driving engagement with the bobbin and situated downstream of the first roller means for winding spun yarn advanced by the first roller means on the bobbin, first and second drive means rotatable in respectively opposite directions for establishing a forward direction of operation of the first roller means and the cylinder, and a reverse, spinning in, direction of operation of the first roller means and the cylinder, respectively, means including reversible clutch means selectively associated with the first and second drive means and coupled to the first roller means and the cylinder, the clutch means being selectively operable in a first, normal position coupling the first drive means to the first roller means and to the cylinder, and a second, operated position coupling the second drive means to the first roller means and the cylinder, respectively, switching means for the clutch, said switching means having an exciting input, means responsive to an actuating signal applied to the exciting input of the switching means for switching the clutch means from its first to its second position during the period of application of the actuating signal to the exciting input of the switching means, detecting means coupled to the output of the withdrawal tube for sensing a yarn breakage upstream thereof, means responsive to the detecting means for generating a control pulse upon the sensing by the detecting means of a yarn breakage, an adjustable pulse duration control means having a triggering input, said pulse duration control means adjusting the duration of the control pulse in response to the application of a signal to its triggering input, means coupled to the output of the detecting means for applying a signal therefrom to the triggering input of the pulse duration control means, and means for applying the thus adjusted control pulse from the output of the control pulse generating means to the exciting input of the switching means for a length of time sufficient to stop the forward movement of the yarn by the roller means and cylinder rotating in the reverse direction but insufficient to cause reverse movement of the broken end of the yarn in the withdrawal tube.

4,104,855

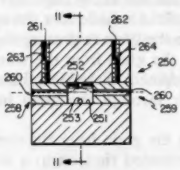
SELF TWIST YARN STRAND SYSTEM

Phillip W. Chambley, and Alan H. Norris, both of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 755,671, Dec. 30, 1976, Pat. No. 4,074,511. This application Jun. 29, 1977, Ser. No. 811,379

Int. Cl.[2] D01H *7/92*

U.S. Cl. 57—77.3 **3 Claims**



1. A yarn twisting jet comprising

a body having an outer surface and a substantially cylindrical bore extending therethrough

an inlet orifice means extending into said body from said outer surface to said bore and intersecting said bore tangentially near the midpoint of its axial dimension, said orifice means being connectable to a source of air under pressure for establishing a generally circular flow of air in said bore;

first and second cylindrical insert members slidably adjustable coaxially along said body bore,

each of said insert members having a central axial opening through which yarn to be twisted can pass, and

the length of each of said inserts being less than one-half the length of said body bore.

4,104,856

CENTER SPACING GAUGE FOR FRICTION TWISTING UNITS

Theodore Leonard Sutton, Enka, N.C., assignor to Akzona Incorporated, Asheville, N.C.

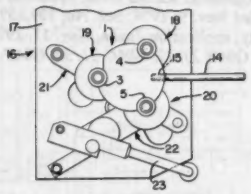
Filed May 18, 1977, Ser. No. 797,941

Int. Cl.[2] D01H *7/92, 13/00*

U.S. Cl. 57—77.4 **10 Claims**

1. In a yarn friction false twist device which includes at least three parallel equiangularly spaced shafts each of which has arranged thereon a plurality of rotatable disks, the improvement comprising a gauge means for center spacing of the shafts, said gauge means including a main body portion and a plurality of means disposed about the periphery of the body

portion for engaging a reference surface of the respective shafts so as to adjust said shafts at a predetermined distance with respect to each other, said engaging means including at least three depressions spaced about the periphery of the body portion, at least two of said depressions having a semi-circular configuration and the third of said depressions having an ob-



tuse arcuate configuration; and said main body portion including a convex outer surface portion disposed between said at least two depressions and a linear surface portion adjoining the third depression and a convex outer surface portion arranged between said linear surface portion and one of the at least two depressions.

4,104,857

SPINNING AND TWISTING DEVICE

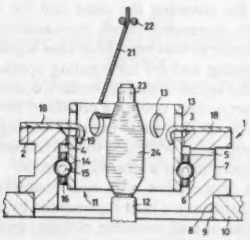
Giorgio Adolfo Grandi, Bologna, Italy, assignor to Fratelli Marzoli & C. S.p.A., Palazzolo S Oglio (Brescia), Italy

Filed May 23, 1977, Ser. No. 799,856

Claims priority, application Italy, Jun. 3, 1976, 3456 A/76

Int. Cl.[2] D01H *7/58*

U.S. Cl. 57—124 **7 Claims**



1. A spinning and twisting device for fitting to the ring support carriage of ring spinners as a replacement for the ring slider devices, comprising an annular stator member, an annular rotor member rotatably coupled to said stator in a manner axially aligned therewith and with the relative spindle of said machine, and provided with a passage for the thread being worked, which rotates it, and braking means disposed between said stator member and said rotor member, said braking means including blades hooked to said rotor member and acting frictionally against said stator member by the effect of the centrifugal force acting on them, part of the centrifugal force being supported by said rotor member at the region in which said blades are hooked thereto.

4,104,858

BIPOLAR LOGIC HAVING GRADED POWER

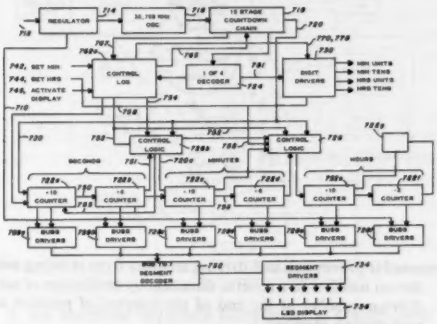
Clark R. Williams, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 443,585, Feb. 19, 1974, Pat. No. 3,986,199. This application Jul. 6, 1976, Ser. No. 703,050

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 A **7 Claims**

1. An electronic watch having a reference frequency generator means, an integrated circuit timekeeping circuit including a frequency divider coupled to said reference frequency generator and counter means coupled to said frequency divider means for producing electrical signals indicative of time, a display means coupled to said counter means for displaying time, and means for coupling a source of power to said integrated circuit and display means for providing power thereto, said integrated circuit being implemented in current injection logic including a plurality of flip-flops comprised of a plurality of cells, each cell having a lateral PNP transistor providing injection base drive into a vertical NPN transistor coupled to operate in the inverse mode, the collector of said lateral transistor and the



base of said vertical transistor commonly sharing a P-type region in said integrated circuit and the base of said lateral transistor and the emitter of said vertical transistor commonly sharing an N-type region in said integrated circuit, the emitters of a plurality of said vertical transistors commonly sharing another P-type region in the integrated circuit and configured such that the vertical transistors of selected of said cells have different emitter geometries than others of said cells, whereby said selected cells are configured to receive a different amount of power from said power source than said other cells.

4,104,859

REVERSAL PREVENTING DEVICE OF ELECTRIC CLOCK

Masuo Ogihara, Chiba; Kozo Sato, Yatsukaido; Nobuo Shinozaki, Chiba; Yuzuru Takazawa, Togane, and Yoichi Seki, Shisui, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed May 13, 1976, Ser. No. 686,082

Claims priority, application Japan, May 14, 1975, 50-63777[U]

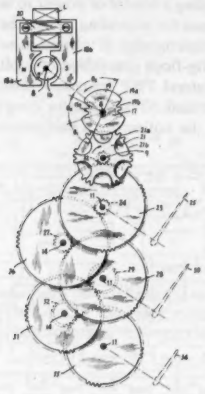
Int. Cl.[2] G04B *19/02*; G04C *3/00*

U.S. Cl. 58—23 D **6 Claims**

1. In an electronic timepiece, the combination comprising:

a stepping motor having a rotor which intermittently rotates in one direction through a predetermined angular interval to a rest position; a rotary driving member driven by said rotor to rotate in one direction during rotation of said rotor and which may develop an oscillation about a rest position after said rotor has rotated through the predetermined angular interval; indicating means including an indicator which changes position for visually indicating the value of a variable; a rotary driven member for driving said indicating means to change the indicator position; said rotary driving member and said rotary driven member together include coupling means for coupling said driving member with said driven member to rotate said driven member in a forward direction as said driving member rotates through a middle portion of its interval of angular rotation, and for disengaging said driving member from said driven member after said driving member has rotated through a middle portion of its interval of angular rotation so that said rotary driven member is intermit-

tently rotated by said rotary driving member to intermittently change the position of said indicator; and



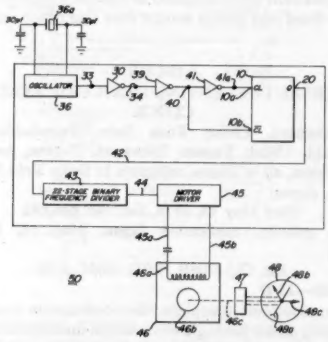
means for preventing said driving member from rotating said driven member in a reverse direction by oscillation of said driving member at the end of the interval of rotation of said driving member.

4,104,860

HIGH SPEED DYNAMIC FLIP-FLOP SYSTEM

Tedd Stickel, Chalfont, Pa., assignor to Solid State Scientific Inc., Montgomeryville, Pa.

Filed Dec. 27, 1976, Ser. No. 754,428
Int. Cl.² G04C *3/00*; H03K *23/30, 3/353*
U.S. Cl. 58—23 R **15 Claims**



1. A high speed dynamic flip-flop frequency divider system controlled only by single phase clock signals having an asymmetrical clock signal cycle comprising

a cascaded asynchronous chain of flip-flops forming a frequency divider, a first flip-flop of said chain having a master and a slave flip-flop section with each of said sections having a different total propagation delay, an output of said master section being coupled to an input of said slave section and an output of said slave section being coupled to an input of said master section, and

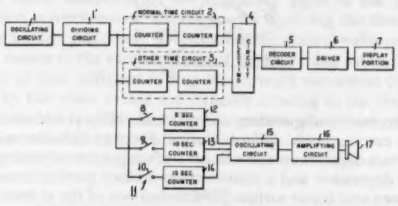
clock means for applying said single phase clock signals both to said master and to said slave sections of said first flip-flop but not to the remainder of the flip-flops of said chain with one cycle portion of each clock signal cycle turning on said master section and the other cycle portion turning on said slave section, said one and other cycle portions respectively having time durations substantially equal to said propagation delays of said master and slave sections thereby to match the duty cycle of said clock signal to the ratio of the propagation delays of said master and slave sections.

4,104,861

ELECTRONIC STOP WATCH

Kazuhiro Yoda, and Michiaki Nakamura, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 9, 1976, Ser. No. 739,857
Claims priority, application Japan, Nov. 11, 1975, 50/135557
Int. Cl.² G04B *23/12*; G04C *21/34*; G04F *10/00*
U.S. Cl. 58—38 R **7 Claims**



1. An electronic stopwatch comprising:

time signal generating means for generating a repetitive time signal having a repetition rate defining an interval of time;

a primary counting circuit responsive to said repetitive time signal and connected to receive said repetitive time signal for counting the same and for developing a progressively increasing count representing advance of time in response to said repetitive time signal and providing a timekeeping mode of operation;

a secondary counting circuit responsive to said repetitive time signal for counting the same and for developing a progressively increasing count representing advance of time in response to said repetitive time signal;

means for applying and for terminating application of said repetitive time signal to said secondary counting circuit to enable said secondary counting circuit to develop a count representative of the time interval during which said repetitive time signal is applied to said secondary counting means for operating in a stopwatch mode;

display means cooperative with said counting circuits for selectively displaying a time represented by the count of a respective one of said counting circuits; and

alarm means connected to receive the repetitive time signal applied to said secondary counting circuit by said means for applying for generating an alarm signal after the repetitive time signal has been applied to said alarm means for a predetermined period of time.

4,104,862

APPARATUS FOR GENERATING AN ALARM SOUND

Hiroshi Yamazaki, and Minoru Izawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Apr. 28, 1977, Ser. No. 791,774
Claims priority, application Japan, Apr. 30, 1976, 51-50657
Int. Cl.² G04C *21/28*; G04B *23/12*
U.S. Cl. 58—38 R **4 Claims**

1. In an electric timepiece comprising a time mechanism, apparatus for generating alarm sound comprising:

a reference switch adapted to be opened and closed by said time mechanism;

a manually operable switch;

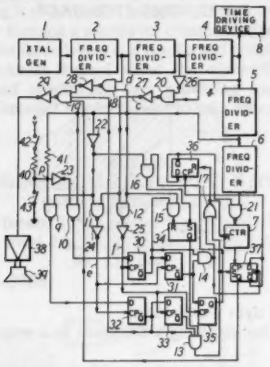
first means adapted to produce different outputs at an output terminal in accordance with the operational statuses of said switches;

a pulse generating circuit adapted to produce a plurality of clock pulse trains;

second means adapted to store the operational statuses of said switches on the basis of an output from said output

terminal and any one of said clock pulse trains and to produce different outputs in accordance with the statuses of the switches;

an alarm sound generating circuit;



and controlling means adapted to control said alarm sound generating circuit upon receipt of an output signal from at least said second means.

4,104,863

ELECTRONIC TIMEPIECE HAVING AN ALARM DEVICE

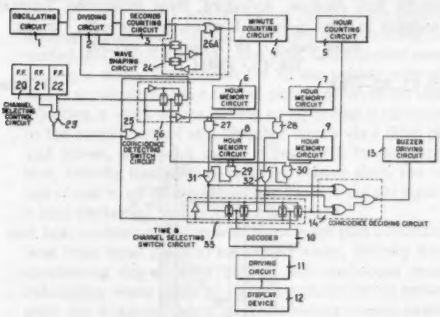
Kenichi Kondo, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 19, 1976, Ser. No. 743,500

Claims priority, application Japan, Nov. 22, 1975, 50-140478

Int. Cl.[2] G04C *21/00;* G04B *23/12*

U.S. Cl. 58—38 R **1 Claim**



1. In an electronic timepiece: a plurality of memory circuits for storing selected alarm times; an alarm responsive to an enabling signal for developing an alarm signal; a coincidence detecting circuit for detecting coincidence between a signal representative of present time and the contents of respective ones of said memory circuits and for applying an enabling signal to said alarm when coincidence is detected; and means for applying the contents of said memory circuits to said coincidence detecting circuit in a time-sharing mode to permit said coincidence detecting circuit to compare all of the alarm time with present time.

4,104,864

ELECTRONIC TIMEPIECE

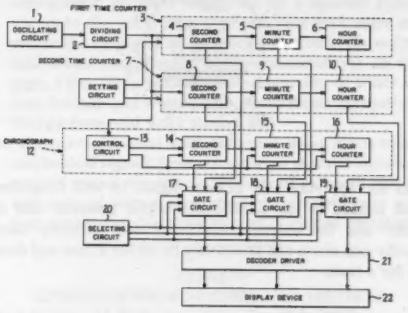
Takehiro Ishikawa; Kazumasa Yasuda; Kazuhiro Asano, and Takashi Ishijima, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 9, 1976, Ser. No. 739,855

Claims priority, application Japan, Nov. 11, 1975, 50-135565

Int. Cl.[2] G04F *10/04;* G04B *19/22;* G04F *7/04*

U.S. Cl. 58—39.5 **1 Claim**



1. An electronic timepiece comprising, in combination: an oscillator circuit for generating a repetitive time standard signal having a repetition rate defining a time base; a dividing circuit connected to receive said time standard signal for dividing the same to develop a repetitive output signal having a repetition rate representing passage of time; a primary time counter of the 24 hour type connected for counting the output signal of said dividing circuit for developing a count representative of time and which advances with the passage of time; a secondary time counter of the 24 hour type connected for counting the output signal of said dividing circuit for developing a count representative of time and which advances with the passage of time; a third time counter of the 24 hour type comprised of a plurality of individual counters in cascade for counting the output signal of said dividing circuit; means for applying the output signal of said dividing circuit to selected ones of said counters comprising said third time counter at a certain time and for terminating application of the output signal of said dividing circuit to operate said third counter in a chronograph mode; a time correcting circuit cooperative with said primary and secondary time counters for setting the respective counts of said primary and secondary time counters; a display circuit responsive to the count of a respective one of said counters for displaying a time represented by the count; and time selecting means for selectively applying the count of a respective one of said counters to said display circuit for displaying a selected time and for operating the timepiece in a timekeeping mode or a chronograph mode.

4,104,865

ELECTRONIC TIMEPIECE HAVING AN ALARM DEVICE

Seikou Sasaki, Matsudo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jun. 24, 1976, Ser. No. 699,360

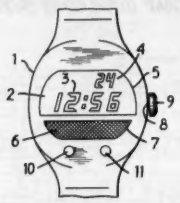
Claims priority, application Japan, Jun. 24, 1975, 50-77847

Int. Cl.[2] G04B *19/24;* G04C *21/28;* G04B *23/12*

U.S. Cl. 58—58 **7 Claims**

1. An electronic timepiece having an alarm device comprising in combination: time counters comprising minute, hour and date counters: at least one channel having memory circuits corresponding respectively to said counters for setting alarm starting time: a coincidence circuit for detecting a coincidence between the output contents of said counters and the output contents of said memory circuits, an alarm generating circuit for generating an alarm signal in response to the output of said

coincidence circuit: said memory circuit in said channel corresponding to said date counter having a memorizing capacity exceeding the counting capacity of said date counter, means for generating a non-set signal without a code signal corresponding to the code signal generated by said date counter, and



means for applying said non-set signal to said coincidence circuit instead of the coincidence signal between said date counter and the output contents of said memory circuit, whereby said alarm can selectively be set for a time and date or only for a time.

4,104,866

TIMEPIECE

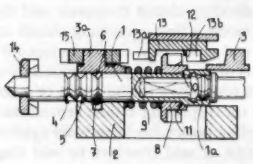
Jean-Maurice Chappatte, Hauterive, Switzerland, assignor to Ebauches Electroniques S.A., Switzerland

Filed Feb. 15, 1977, Ser. No. 768,858

Claims priority, application Switzerland, Feb. 19, 1976, 2011/76

Int. Cl.² G04C *19/24;* **G04B** *27/00*

U.S. Cl. 58—85.5 **1 Claim**



1. A timepiece having at least one element intended for manual operation, said timepiece comprising, a rotatable control stem movable between at least two axial positions, a pinion having two axial faces and being loosely mounted on said stem, a coil spring positioned upon the stem and engaged between one axial face of the pinion and the frame of the timepiece, said spring being operable upon the opinion to urge the same for axial movement in one direction on the stem, said pinion having a frusto-conical recess (on the axial face) thereof opposite said one axial face, said stem having a shoulder of frusto-conical configuration adapted for mating engagement with said recess on the pinion, whereby when the stem is moved to one axial position thereof the shoulder engages the frusto-conical recess of the pinion to render the stem and pinion angularly rigid with respect to each other and the pinion is moved into meshed engagement with said element, the engagement between the stem and pinion being a friction coupling operable as a torque limitator.

4,104,867

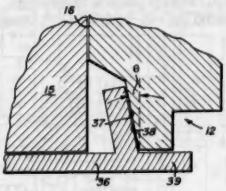
WATER-TIGHT WATCH CASE

Daniel A. Worsham, San Jose, Calif., assignor to Pacific Western Systems, Mountain View, Calif.

Filed Feb. 27, 1976, Ser. No. 662,145

Int. Cl.² G04B *37/00, 37/08*

U.S. Cl. 58—90 R **8 Claims**



1. In a fluid tight watch case:

case means for enclosing a timepiece in a water-tight manner;

said case means having a removable cover portion for providing physical access to the interior of said case means when said cover portion is removed; and

said case means and said cover portion thereof, each having an annular generally incompressible sealing ring surface portion formed and arranged so as to permit substantial relative axial translation therebetween for axially press fitting together in water-tight sealing engagement to form an annular water-tight seal therebetween, one of said annular sealing surfaces being disposed facing radially inwardly of said annular seal to be formed and disposed for mating with the other annular sealing surface which faces radially outwardly and wherein said inwardly facing annular sealing surface is of a truncated conically tapered configuration, said water-tight seal being made essentially solely due to an axially pressed interference-contact fit between said pair of mated annular sealing ring surface portions.

4,104,868

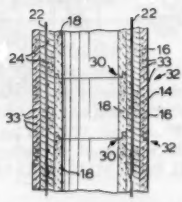
PRECAST CHIMNEY SYSTEM

Kenneth Roy Jackson, Aylesford, Near Maidstone, England, assignor to Hankin-Baker Limited, Scarborough, Canada

Filed Jun. 17, 1977, Ser. No. 807,501

Int. Cl.² E04H *12/12*

U.S. Cl. 52—743 **3 Claims**



1. A method of constructing a composite chimney having a unitary cross-section through the wall thereof, comprising the steps of:

providing an inner precast lining composed of annular segments in interfitting stacked relationship,

forming a plurality of reinforced annular segments by placing a plurality of circumferential steel hoops in each of a plurality of concrete annular segments to reinforce each of said segments against circumferential stressing,

providing a precast concrete outer wall composed of said annular reinforced segments in interfitting relationship

surrounding said lining and spaced outwardly therefrom in non-contacting relationship therewith to define an interstitial gap,

providing linked longitudinal and circumferential reinforcing steel bars within said interstitial gap,

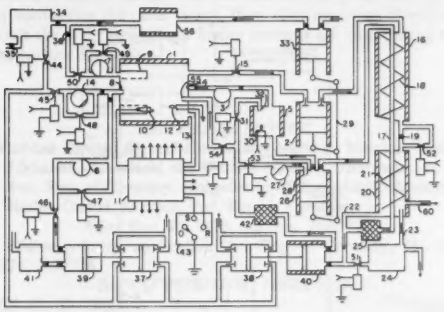
and pouring in situ concrete into said interstitial gap and allowing it to harden to integrally connect said outer wall thereby forming a multilayer chimney which is composed of at least three layers and is solid and continuous through the thickness thereof about the circumference thereof with said reinforcing bars providing longitudinal and circumferential reinforcement to said concrete.

4,104,869

STEAM ENGINE WITH STEAM HEAT RECOVERY AND STEAM COMPRESSION

Ogden W. Vincent, 2166 La Miel Way, Campbell, Calif. 95008

Filed Jan. 21, 1977, Ser. No. 761,350
Int. Cl.[2] F02C 7/00
U.S. Cl. 60—39.55 **19 Claims**



1. A steam engine comprising:

a pressurized combustion chamber means having a fuel injection device for injecting pressurized fuel, said chamber means having an oxygen port for injection of an oxygen bearing pressurized gas for oxidizing the fuel during combustion, a fuel igniting element producing heat, said chamber means having an output port, said chamber means having a water injection device for injecting pressurized water, said chamber means having a temperature sensing element and having a pressure port which is connected to a transducer via a first pipe, said chamber means having a steam port connected to the output port of a steam accumulator via a second pipe and valves for steam injection, a work means having an input that is connected to the output port of said chamber means via a third pipe and valves, said work means doing work by gas expansion, thereby transmitting work by a drive shaft, the output of said work means exhausting gases to the gas input of a heat exchanger means via a fourth pipe,

said heat exchanger means with a gas input port conducting heat from input gases to recovered water, thereby water condensing for a water output, said exchanger means exhausting waste gases to the atmosphere via an exhaust pipe, for a steam output said exchanger means heating recovered input water with input gases,

a steam compressor means having an output and having an input which is connected to the steam output of said exchanger means, said steam compressor means having a water injection device for the injection of pressurized water during compression, said compressor means receiving motivation energy from said drive shaft,

said pressurized steam accumulator means having an output port and having an input port which is connected to the output of said steam compressor means,

an air compressor means having an input connected to the atmosphere and an output connected to an air accumulator, said air compressor means receiving motivation energy from said drive shaft, the output of said air accumulator being connected to an auxiliary air tank and to said chamber means via a fifth pipe and valves,

a pressure producing fuel pump means having an input connected to a fuel tank, the output of said fuel pump means being connected to said fuel injection device via a sixth pipe and valves, said fuel pump means receiving motivation energy from said work means,

a pressure producing water pump means having an input at atmospheric pressure connected by a seventh pipe and valves to the water output of said heat exchanger means and to the output of an auxiliary water tank, the output of said water pump means being connected via an eighth pipe, a first filter, and valves to a plurality of water injection devices, said water pump means receiving motivation energy from said work means, and

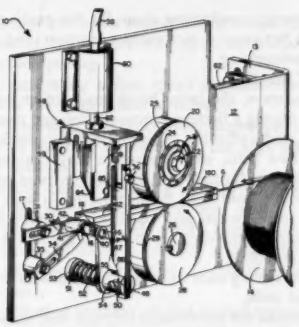
an electro-mechanical control means using electronic and mechanical signals from components as input signals, said control means operating a plurality of valves in pipe lines, said control means generating output electronic signals and mechanical functions to control engine functions.

4,104,870

LINK-MAKING MACHINE AND METHOD

Albert Robbio, 16 Fyffe Ave., Cranston, R.I. 02920

Filed May 20, 1976, Ser. No. 688,350
Int. Cl.[2] B21L 7/00
U.S. Cl. 59—20 **11 Claims**



1. A device for forming links from a wire comprising:

(a) a frame;

(b) a first power source associated with said frame;

(c) a mandrel mounted on the frame outwardly directed from the frame and arranged to receive the wire thereon;

(d) means to form the wire adapted to the frame adjacent the mandrel, disposed to receive the wire and to direct the wire around the mandrel to form a plurality of loops thereon, the outermost of which is positioned toward one end of the mandrel and characterized by an open eccentric end portion;

(e) means to provide wire connected to said first power source, adapted to the frame and positioned to direct the wire upon the means to form the wire; and activated by said power source to move the wire from a first position to a second position closer to the means to form the distance between the positions substantially corresponding to that length of wire required for one link;

(f) means to close the outermost eccentric loop to form a link arranged to move between a position distant from the outermost eccentric loop to a position in contact with outermost eccentric loop to close the outermost eccentric loop;

(g) a cutter connected to a second power source adapted to the frame and joined to the means to close the outermost

eccentric loop which is closed before the link is cut from the wire having a blade-member connected to the power source and activated thereby to move between an open position distant from the mandrel to a closed position close to the mandrel to cut the link from the wire.

4,104,871

ENERGY CONDUCTING CHAIN

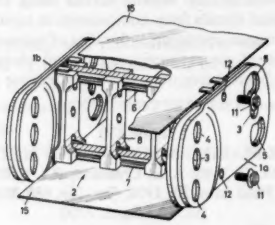
Werner Moritz, Siegen, Fed. Rep. of Germany, assignor to Kabelschlepp Gesellschaft mit beschränkter Haftung, Siegen, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,172

Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622006

Int. Cl.[2] F16G *13/16*

U.S. Cl. 59—78.1 **5 Claims**



1. An energy conducting chain for the guiding of transmission lines between a moveable consumer and a stationary terminal comprising

links of the chain,

divisible stays, the latter being made of at least two belts each having a flattened cross-section and rounded narrow sides, and a plurality of separation stays arranged between said two belts, said separation stays having upper and lower ends formed with beveled recesses provided with undercuts, said belts being inserted in said recesses and held force-locked and positively without slipping with said separation stays upon twisting about a longitudinal axis thereof,

said belts having ends and being formed with threaded bores in said ends,

screw means for penetrating through said links of the chain and screwed-into said threaded bores,

reinforcement plates inserted between said belts and said links of the chain.

4,104,872

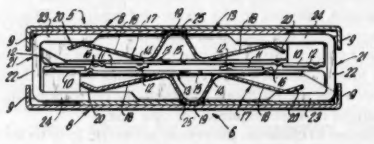
ADJUSTABLE EXPANSION BAND FOR WRISTWATCH

Sander G. Dukas, Kowloon, Hong Kong, assignor to Timex Corporation, Waterbury, Conn.

Filed May 12, 1977, Ser. No. 796,300

Int. Cl.[2] F16G *13/24*; A44C *5/08*

U.S. Cl. 59—79 R **4 Claims**



1. In an expansion band of the type having two rows of overlapping links, clip members connecting alternating links between rows, and spring members disposed within said links, the improvement comprising:

a pair of asymmetrical legs on each of said clip members disposed in the ends of alternating links, said clips arranged on opposite ends of the links, and

spring retaining means disposed within said links arranged to hold said spring members and adapted to be movable between locked and unlocked positions, said spring members each having spring arms cooperating with both of the legs of opposite clip members in the locked position and cooperating with only one leg of a clip member in the unlocked position.

4,104,873

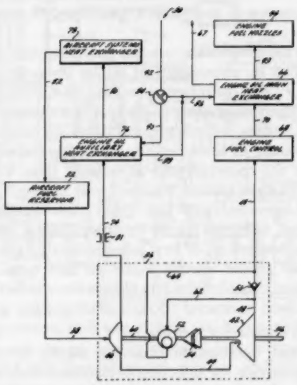
FUEL DELIVERY SYSTEM INCLUDING HEAT EXCHANGER MEANS

George A. Coffinberry, Cincinnati, Ohio, assignor to The United States of America as represented by the Administrator of the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 29, 1976, Ser. No. 745,766

Int. Cl.[2] F02C *9/06*

U.S. Cl. 60—39.28 R **15 Claims**



12. In a fluid delivery system associated with a gas turbine engine, the improvement comprising:

a fluid supply reservoir;

pump means for pressurizing a first fluid received from said first reservoir;

a pair of heat exchangers disposed in a parallel fluid receiving relationship with said pump means and receiving first fluid discharged therefrom;

valve means operative in a first mode for providing flow of a second fluid through one heat exchanger of said pair and in a second mode for bypassing said one heat exchanger.

4,104,874

DOUBLE-WALLED COMBUSTION CHAMBER SHELL HAVING COMBINED CONVECTIVE WALL COOLING AND FILM COOLING

Jacques E. J. Caruel, Dammarie les Lys, and Guy D. Stora, Melun, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Feb. 1, 1977, Ser. No. 764,655

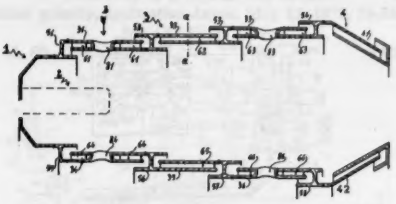
Claims priority, application France, Feb. 6, 1976, 76 03921

Int. Cl.[2] F02C *7/18*

U.S. Cl. 60—39.65 **3 Claims**

1. A combustion chamber shell, particularly for turbojet engines, wherein the said chamber is housed within a housing in which a current of air intended, on the one hand, to supply the combustion air and, on the other, to cool the walls of the said shell flows from front to rear and is of the type composed of sleeves whose diameters increase from front to rear and which have two facings, namely an outer one and an inner one, characterized by the fact that it contains between the sleeves

annular connecting parts of H section which consist of a web joining two cylindrical flanges, namely, an inner one and outer one, each of which has a free edge, each such free edge forming, respectively, with the outer facing of the sleeve located to the front and with the inner facing of the sleeve located to the



rear, an annular intake channel section which faces frontwards and an annular discharge channel section which faces rearwards, in such a fashion that the said current of air first cools by convection the outer facing, then, after reversing direction, cools the inner facing, and finally protects the inner facing by the surface film effect.

4,104,875

ION PRIME MOVER

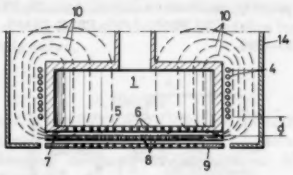
Winfried Birner, Eichenkofen; Hans Mueller, Munich; Horst Listmann, Sauerlach, and Helmut Bassner, Ottobrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 23, 1976, Ser. No. 754,092

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633778

Int. Cl.² F02K *11/00*; H05H *1/16*

U.S. Cl. 60—202 **7 Claims**



1. An ion engine comprising an ionization chamber, anchor means with apertures therein for providing a plasma boundary in said ionization chamber, high frequency winding means surrounding said ionization chamber for generating a high frequency alternating electromagnetic field in said ionization chamber to ionize a gas in said ionization chamber, anode means arranged in said chamber, cathode means with apertures therein also arranged in said chamber to form an anode-cathode path for accelerating the ionized gas through said apertures in said plasma boundary anchor means and in said cathode out of said ionization chamber, said high frequency winding means being arranged in such a position above said cathode means as to maintain the field lines of said high frequency alternating electromagnetic field substantially undisturbed in the area adjacent to said plasma boundary anchor means, and to keep said field lines substantially at a right angle relative to the surface of said plasma boundary anchor means facing into said ionization chamber.

2. The ion engine of claim **1**, wherein said cathode has a thickness which is proportional at least to the penetration depth "*s*" of said high frequency alternating electromagnetic field into said cathode, said depth "*s*" being determined by the formula

$$s = 1/(\pi f \mu_o \mu_r \kappa),$$

wherein $\pi = 3.14$; f = frequency of said electromagnetic field in Hz; $\mu_o = 1.256$ (μH/m) = absolute permeability; μ_r = relative permeability and κ = specific permeability (S m/mm²) of the cathode mterial.

4,104,876

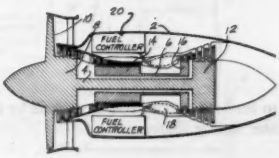
FAN R. P. M. CONTROL LOOP STABILIZATION USING HIGH ROTOR SPEED

Hals Norman Larsen, Redmond, and Peter Werner Kamber, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 679,594, Apr. 23, 1976, abandoned. This application Dec. 2, 1976, Ser. No. 746,649

Int. Cl.² F02K *3/06*; F02C *9/04*

U.S. Cl. 60—226 R **6 Claims**



1. In a twin spool turbofan engine having a high speed spool, a fan spool, and fuel controller, a fan spool control loop stabilization system comprising:

means for generating a first speed dependent signal as a function of fan spool speed of rotation;

means for generating a second speed dependent signal as a function of the rate of change of the high speed spool speed of rotation;

signal summing means for adding said first speed dependent signal to said second speed dependent signal;

means for comparing said sum with a signal indicative of a desired fan spool speed of rotation and producing therefrom an error signal porportional to the difference therebetween; and,

means for adjusting the flow of fuel to said turbofan engine from said fuel controller in response to said difference signal such that the rotation of the fan spool is equivalent to and stable with said desired fan spool speed of rotation.

4,104,877

SUSPENSION SYSTEM FOR NOZZLE OF JET PROPELLED VEHICLE

Geoffrey Edward Bone, Crowthorne, and Peter Baguley Allen, Wokingham, both of England, assignors to Sperry Rand Limited, Bracknell, England

Filed Apr. 25, 1977, Ser. No. 790,357

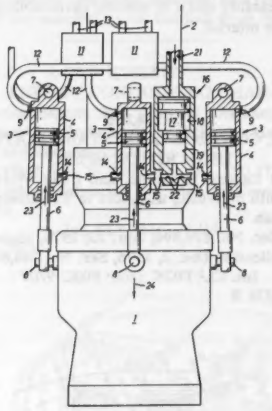
Claims priority, application United Kingdom, Apr. 30, 1976, 17637/76

Int. Cl.² F02K *9/00*

U.S. Cl. 60—230 **10 Claims**

1. A suspension system for a pivotal nozzle of a jet propelled vehicle having a gas generator operable to effect propulsion of the vehicle, the system comprising a plurality of actuators connected to the exhaust nozzle and operable to effect pivotal movement thereof to steer the vehicle in a desired direction, each actuator comprising a movable member connectible on one side to a source of fluid power to effect nozzle movement with the other side of the member being interconnected with said other side of each other actuator movable member to form

a fluid suspension for the nozzle, in use the suspension being pressurised to produce a force acting on the nozzle in a direc-



tion opposite to the load imposed on the nozzle by the gas from the gas generator acting thereon.

4,104,878

PRESSURE RESISTANT MEMBER

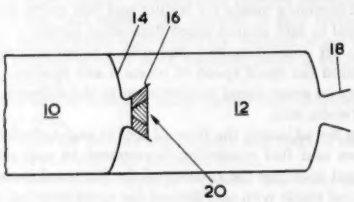
Michael John Chase, Kidderminster, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 13, 1976, Ser. No. 750,018

Claims priority, application United Kingdom, Dec. 23, 1975, 52618/75

Int. Cl.² F02K *9/04*

U.S. Cl. 60—245 **6 Claims**



1. A member for controlling flow between pressure zones comprising an assembly of discrete segments adhesively bonded together in side-by-side relationship to form a disc-like member, the assembly being adapted for location in an opening between the zones in use such that it will resist flow between the zones via the opening in one direction, but will disintegrate into bodies no larger than said discrete segments to permit flow between the zones in the opposite direction.

4,104,879

SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Hidetaka Nohira, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 22, 1976, Ser. No. 679,448

Claims priority, application Japan, Dec. 26, 1975, 50-157477

Int. Cl.² F01N *3/10*

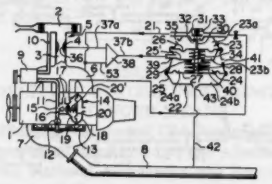
U.S. Cl. 60—290 **8 Claims**

1. A system for supplying secondary air into an exhaust system of an internal combustion engine by a flow rate substantially proportional to that of exhaust gases, comprising:

a source of secondary air;

a passage means for conducting secondary air from said source to said exhaust system of the engine;

a secondary air control valve provided in the midst of said passage means for controlling the supply of secondary air to said exhaust system depending upon a control signal pressure supplied thereto;



a pressure regulating valve for regulating the pressure of said control signal pressure;

said pressure regulating valve having a valve member; and

means positioning said valve member in accordance with a balance between a pressure representative of a carburetor venturi vacuum and the exhaust gas pressure of the engine.

4,104,880

EXHAUST GAS PURIFYING SYSTEM HAVING A DIAPHRAGM TYPE CONTROL VALVE

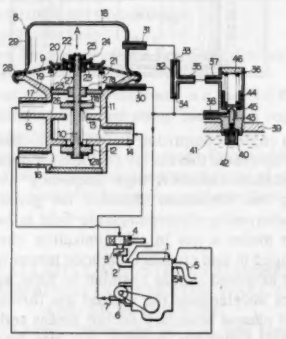
Mikiji Ito, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 28, 1976, Ser. No. 681,050

Claims priority, application Japan, Apr. 29, 1975, 50-51699

Int. Cl.² F01N *3/10;* **F02B** *75/10*

U.S. Cl. 60—290 **19 Claims**



1. An exhaust gas purifying system for an engine comprising:

a valve arrangement, having a diaphragm and a couple of chambers divided by said diaphragm, for switching on and off the air injected into an internal combustion engine in response to negative pressure introduced into one of said chambers from the engine,

means connected to said couple of chambers for passing the air from one of said chambers to the other to equalize the pressures in said both chambers in one of a plurality of predetermined different time delay periods, and

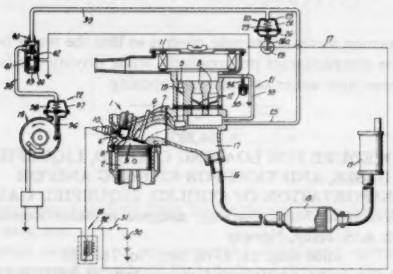
means, connected to said air passing means, for changing to another of said periods in response to a change in the temperature of the engine.

4,104,881

PREVENTION OF OVERHEATING OF CATALYTIC CONVERTER FOR ENGINE EXHAUST GASES

Hiroshi Kogure, and Junichi Shimada, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1976, Ser. No. 684,064
Claims priority, application Japan, May 12, 1975, 50-56433
Int. Cl.[2] F02B 75/10
U.S. Cl. 60—299 3 Claims



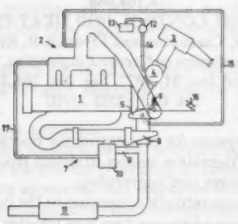
1. Apparatus for preventing overheating of a catalytic converter receiving exhaust gases from an internal combustion spark-ignition engine comprising, in combination: an exhaust reaction chamber interposed between said engine and said catalytic converter, means including at least one throttle valve for supplying an air-fuel mixture leaner than the stoichiometric ratio for combustion in the engine, auxiliary means including an intake passage for supplying an air-fuel mixture richer than the stoichiometric ratio for ignition and combustion in the engine, sensing means for sensing deceleration conditions in the engine by sensing an increase in intensity of intake vacuum, means responsive to said increase for retarding the spark ignition timing, and means responsive to said increase for introducing supplemental air downstream from the throttle valve to reduce the air-fuel ratio of the mixture received for combustion by the engine during deceleration from the means including at least one throttle valve.

4,104,882

SUPER-CHARGED CARBURETOR ENGINE

Per Sune Gillbrand, and Anders Erik Bertil Johansson, both of Enhörna, Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Dec. 3, 1976, Ser. No. 747,386
Claims priority, application Sweden, Dec. 10, 1975, 7513897
Int. Cl.[2] F02D 23/00
U.S. Cl. 60—600 5 Claims



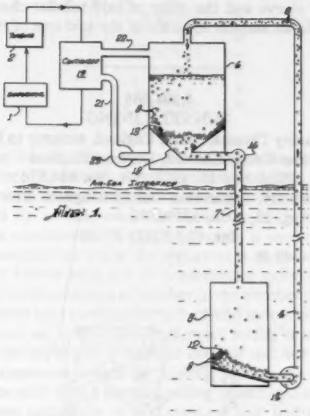
1. In an internal combustion engine, an inlet system for taking in air, mixing the air with fuel and feeding the resulting fuel-air mixture to the engine, the inlet system including in flow sequence a throttleless carburetor for mixing fuel with air flowing in the system, a compressor positioned downstream of the carburetor for compressing the resulting fuel-air mixture, a throttle positioned downstream of the compressor for regulating the pressure of the compressed fuel-air mixture flowing in the system downstream of the carburetor, and conduit means for conducting the compressed, throttled fuel-air mixture to the engine.

4,104,883

MASS TRANSPORT HEAT EXCHANGER METHOD AND APPARATUS FOR USE IN OCEAN THERMAL ENERGY EXCHANGE POWER PLANTS

Frederick E. Naef, Reston, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 27, 1977, Ser. No. 801,180
Int. Cl.[2] F01K 9/00; F03G 7/04
U.S. Cl. 60—641 12 Claims



1. A method of condensing the working gas of an ocean thermal energy conversion system comprising:

mixing in a sub-surface tank disposed at an ocean depth a supply of temperature-sensitive phase-transformation particles with cold ambient sea water for forming a slurry having a temperature essentially equal to that of the ambient water,

delivering said cold slurry upwardly from said tank depth into a surface-disposed tank,

returning said particles from said surface tank to said sub-surface tank,

exposing at said surface level said working gas to the temperature of the surface tank slurry, and

withdrawing the sea water from said surface tank and recirculating it as an influent back into said surface tank,

said temperature-sensitive particles being of a type capable of undergoing a phase transformation at a temperature between that of said sub-surface ambient sea water and said surface tank influent.

4,104,884

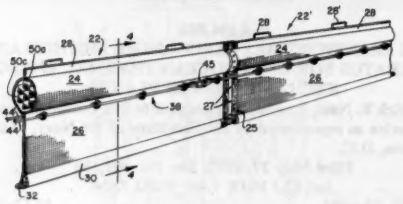
INFLATABLE BARRIER

Paul Preus, Smith Rd., Toms River, N.J. 08753

Continuation of Ser. No. 676,795, Apr. 14, 1976, abandoned.
This application Apr. 13, 1977, Ser. No. 786,993
Int. Cl.[2] E02B 15/04
U.S. Cl. 61—1 F 3 Claims

1. A barrier for water carried pollutants comprising a series of end to end connectable boom sections, each boom section comprising a flexible tubular sleeve, seven inflatable tubular chambers removably insertable within said flexible tubular sleeve and extending substantially the entire length of the flexible sleeve, each of said tubular chambers terminating at least at one end of the sleeve in inflation valve means and each

of said tubular chambers being closed at the opposite end and when said inflatable chambers are inflated said chambers comprising the primary flotation means for the boom sections, each said boom section being particularly characterized in that one



of the seven tubular chambers is positioned about the axis of the tubular sleeve and the other of said tubular chambers are positioned in an annular zone about the said one of the tubular chambers.

4,104,885

TUNNEL LINING

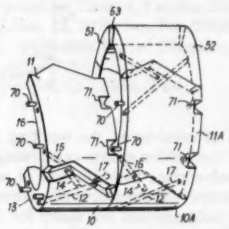
Norman Stanley Thomas, Stone, England, assignor to Fairclough Construction Group Limited, London, England

Filed Jun. 15, 1977, Ser. No. 806,874

Claims priority, application United Kingdom, Jun. 21, 1976, 25652/76; Aug. 13, 1976, 33798/76

Int. Cl.[2] E21D *11/08*

U.S. Cl. 61—45 R **18 Claims**



1. A concrete segment for an annulus of a tunnel lining, having an end connectable to an end of another, identical, segment of the annulus abutting thereagainst by means of connecting dowels insertable from an edge of the segment other than the abutting end thereof into at least two channels within the segments, each channel extending through an edge of the segment and in alignment with the end of and partially into said abutting segment, the channels being disposed at an angle to one another whereby the segments are held together when the dowels are in position.

4,104,886

FLOAT FOR USE IN LAYING SUBMARINE PIPELINES

Michel Paul Dumont, Paris, and Jacques Edouard Lamy, Fontenay-aux-Roses, both of France, assignors to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris", Paris, France

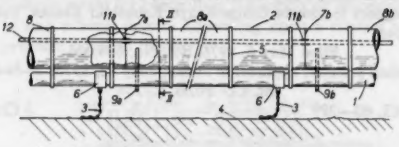
Filed May 27, 1977, Ser. No. 801,362

Claims priority, application France, May 31, 1976, 76 16329; Jul. 13, 1976, 76 21430

Int. Cl.[2] F16L *1/00*

U.S. Cl. 61—112 **17 Claims**

1. A float device for use in laying a submarine pipeline from a launching base, comprising tubular means fixed to the pipeline and forming a plurality of compartments therealong, means isolating the compartments from each other, a liquid less dense than water filling the compartments, means opening towards the bottom for putting each compartment into communication with the sea, means for opening passages interconnecting the compartments, an opening at an end of the tubular means situated at the launching base, and means for actuating



said opening means by remote control so that the water occupies the compartments progressively while driving the liquid less dense than water towards said opening.

4,104,887

PROCEDURE FOR LOADING COOLED, LIQUEFIED GASES, AND TANK FOR STORING AND/OR TRANSPORTATION OF COOLED, LIQUEFIED GASES

Rolf Kvamsdal, Moss, Norway, assignor to Moss Rosenberg Verft A/S, Jeloy, Norway

Filed Aug. 11, 1976, Ser. No. 713,621

Claims priority, application Norway, Jun. 29, 1976, 762252

Int. Cl.[2] F17C *7/02*

U.S. Cl. 62—45 **8 Claims**

1. The method for loading cooled, liquefied gases in a non-cooled tank which is mounted on a peripheral skirt support structure at least partially surrounding said tank and which tank includes an integral transitional support member forming a portion of the tank wall and being rigidly secured to said skirt support, said method comprising the steps of, directly cooling said transitional support member between the tank and the skirt support structure and thereafter loading liquefied gases in the tank.

4,104,888

DEFROST CONTROL FOR HEAT PUMPS

Wayne R. Reedy, Cazenovia, and Fredrick R. Eplett, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,321

Int. Cl.[2] F25D *21/02*

U.S. Cl. 62—80 **14 Claims**

1. A control system for monitoring the operation of a vapor compression refrigeration system to detect frost accumulation on a heat exchanger coil comprising;

a compressor operatively connected to the coil for effecting thermal contact between two heat transfer media to effect transfer of heat from one medium to another medium,

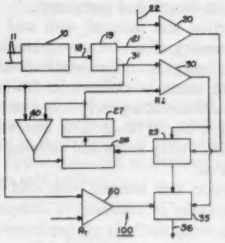
sensor means operatively connected to said vapor compression refrigeration system for providing an output signal in response to an operational parameter of said vapor compression refrigeration system responsive to the rate of heat transfer;

means coupled to the output signal from the sensor means for generating a reference signal having a reference level

dependent upon the output signal from the sensor means in response to an absence of frost on the coil;

comparator means coupled to said output signal from said sensor means and to said reference signal from said means for generating a command signal in response to said output signal varying from the predetermined reference signals; and

means coupled to said command signal and operatively connected to said coil for initiating a change in the rate of heat transfer between the two heat transfer media in response to the presence of said command signal.



4,104,889

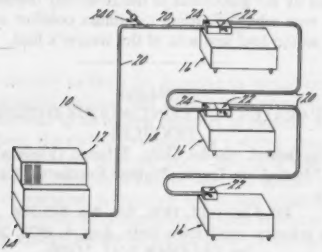
ICE TRANSPORT AND DISPENSING SYSTEM

Walter Harold Hoenisch, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.

Continuation of Ser. No. 395,712, Sep. 10, 1973, abandoned. This application Oct. 14, 1975, Ser. No. 622,151

Int. Cl.² F25C *5/18*

U.S. Cl. 62—137 **38 Claims**



1. An ice transport system for selectively distributing ice from a source thereof to at least two remote stations,

said system including an ice making machine and means defining an ice flow path communicating with said stations,

a blower providing a relatively high velocity flow of air communicable with said flow path for transferring ice therealong,

an ice diverting apparatus,

ice level sensing means at each of said stations for sensing the quantity of ice and for providing a control signal to said ice diverting apparatus, said apparatus being operable in a first mode to cause ice to be communicated from said flow path toward one of said stations and being actuatable in response to said signal to a second mode to cause ice being transferred along said path to bypass said one station and be communicated toward the other of said stations, and

an electrical control circuit operatively associated with said ice making machine, blower and said ice level sensing means for effecting deenergization of said machine and said blower when the volume of ice at said stations is at a predetermined magnitude.

4,104,890

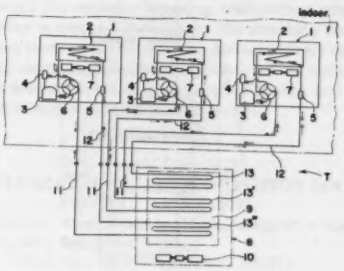
AIR CONDITIONING APPARATUS

Ryohei Iwasaki, Fujisawa, Japan, assignor to Matsushita Seiko Co., Ltd., Osaka, Japan

Continuation of Ser. No. 692,579, Jun. 3, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 823,172

Int. Cl.² F25B *13/00, 7/00, 1/10*

U.S. Cl. 62—324 **6 Claims**



1. An air conditioning apparatus which comprises: at least one outdoor unit having therein an outdoor heat exchanger, said outdoor heat exchanger having a plurality of coils each constituted by at least one heat exchange medium pipe and acting as a condenser when the apparatus is used for cooling and as an evaporator when the apparatus is used for heating; a plurality of indoor units for air conditioning individual indoor spaces and corresponding in number to the number of said coils in said outside heat exchanger, each of said indoor units having a compressor, an indoor heat exchanger acting as an evaporator when the apparatus is used for cooling and as a condenser when the apparatus is used for heating; pipe means connecting each indoor unit with a corresponding one of said coils in said outdoor heat exchanger of said outdoor unit; and a four way valve in each indoor unit connected between said compressor and said indoor heat exchanger and said pipe means for switching flow of heat exchange medium from a flow from said compressor to said indoor heat exchanger and from said outdoor heat exchanger to said compressor to a flow from said compressor to said outdoor heat exchanger and from said indoor heat exchanger to said compressor, whereby the pressure of the heat exchange medium flowing in said pipe means is substantially uniform at a high pressure when said apparatus is used for cooling and substantially uniform at a low pressure when said apparatus is used for heating.

4,104,891

TORSIONALLY ELASTIC MECHANISM

Leonhard Geislinger, Hofelgasse 26, Salzburg, Austria

Filed Nov. 5, 1976, Ser. No. 739,111

Claims priority, application Austria, Nov. 13, 1975, 8671/75

Int. Cl.² F16D *3/14*

U.S. Cl. 64—26 **2 Claims**

1. A torsionally elastic mechanism which comprises

(a) a central portion including an inner member,

(1) the central portion defining a reservoir,

(b) an outer member elastically coupled to the inner member for rotation therewith,

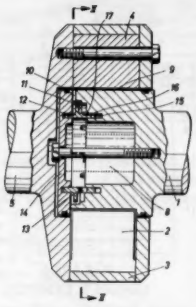
(1) the inner and outer members defining therebetween first and second chambers, and

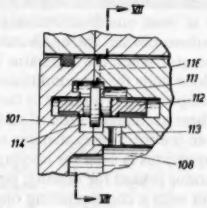
(2) gap means through which the first and second chambers communicate with each other,

(c) passage means connecting the reservoir to at least part of the chambers,

(d) a damping liquid in the reservoir and, upon the rotation of the coupled members, centrifugally flowing from the reservoir into the chambers through the passage means and filling the chambers, the passage means permitting the damping liquid to flow back into the reservoir,

(l) the inner and outer members being angularly displaceable relative to each other during the rotation and arranged to displace the liquid filling the chambers between the first and second chambers through the gap means during angular displacement so as to perform a damping action, and





(e) sliding valve means disposed in the passage means and arranged therein for sliding from a neutral position under the liquid flow,

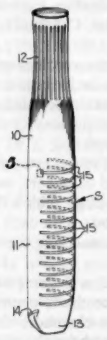
(l) the sliding valve means being arranged to present a lower resistance to the flow of the liquid from the reservoir into the chambers than to the flow of the liquid from the chambers into the reservoir.

4,104,892

CUSHIONED SOLE TUBE SOCK AND METHOD

James L. Thorneburg, Statesville, N.C., assignor to Thorneburg Hosiery Mill, Inc., Statesville, N.C.

Filed Nov. 15, 1976, Ser. No. 741,885
Int. Cl.[2] A41B *11/02*
U.S. Cl. 66—185 6 Claims



1. A knitted heelless stretchable tube sock, said sock being characterized, due to the lack of a heel pocket, by a tendency to gather and form wrinkles in the upper instep area due to the presence of surplus fabric in such area when the sock is worn in stretched condition, said sock comprising

(a) a leg portion knit of a plurality of consecutive complete courses and having substantially the same fabric thickness throughout its length and periphery,

(b) a heel portion knit integral with said leg portion and having a plurality of consecutive complete courses, said heel portion being circumferentially divided into first and second fabric areas of differential fabric thickness, said first fabric area including terry loops on the inner surface and defining a heavy fabric area, said second fabric area being devoid of terry loops and defining a relatively thinner fabric area,

(c) a foot portion knit integral with said heel portion and having a plurality of consecutive complete courses, said foot portion being similarly circumferentially divided into first and second fabric areas of differential fabric thickness, said first fabric area including terry loops on the inner surface and defining a heavy fabric area, said second fabric area being devoid of terry loops and defining a relatively thinner fabric area, said first and second fabric areas of said foot portion being aligned with corresponding first and second fabric areas of said heel portion,

(d) a closed toe portion formed integral with said foot portion, and

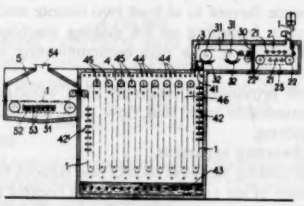
(e) means on the outer surface of said foot portion for identifying the relative positions of said first heavy fabric areas and said second relatively thinner fabric areas of said heel and foot portions to guide the wearer in placing the sock on the foot so as to position said relatively thinner fabric areas on top of the wearer's foot and said heavy fabric areas beneath the heel and sole of the wearer's foot whereby the tendency of the surplus fabric to form wrinkles at the upper instep area of the wearer's foot is minimized by the placement of the relatively thinner fabric at that area while affording maximum comfort and protection to the heel and sole of the wearer's foot.

4,104,893

APPARATUS FOR CONTINUOUS DYEING OF TEXTILES

Bruno Marchesini, via del Colle, Trissino (Vicenza), and Fernando Martini, via Trento, Piovene Rocchette (Vicenza), both of Italy

Filed May 11, 1976, Ser. No. 685,300
Claims priority, application Italy, Aug. 4, 1975, 26062 A/75
Int. Cl.[2] D06B *3/12, 21/00*
U.S. Cl. 68—5 E 5 Claims



5. In an apparatus for continuously dyeing a textile fabric and comprising a chamber for preheating said fabric, a chamber for applying onto said fabric a dyestuff solvent solution, a chamber for fixing said dyestuff onto said fabric and vaporizing off from said fabric said solvent, the improvement comprising a developing chamber for fixing said dyestuff onto said fabric, said developing chamber comprising:

(a) first and second side walls;

(b) a ceiling;

(c) a flooring;

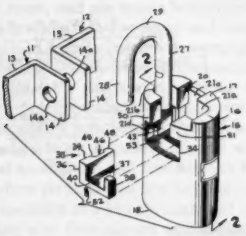
(d) an inner upper zone of superheated solvent vapor;
(e) an inner lower zone of saturated solvent vapor;
(f) a plurality of guide rollers positioned near said ceiling and said flooring for advancing said fabric from said first to said second side wall and alternately through said zones;
(g) a first group of heating means positioned near said flooring to create said saturated solvent vapor in said lower zone;
(h) second and third groups of heating means positioned at said first and second side walls, respectively, to create said superheated solvent vapor in said upper zone and to prevent condensation of said solvent on said walls; and
(i) a fourth group of heating means positioned near said ceiling to assist in the creation of said superheated solvent vapor in said upper zone and to prevent condensation of said solvent on said ceiling.

4,104,894

PADLOCK HAVING WEDGE DEVICE FOR RESISTING DESTRUCTIVE WEDGE ATTACK

James Clayton Miller, and Paul R. Proefrock, both of Nicholasville, Ky., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Oct. 3, 1977, Ser. No. 839,458
Int. Cl.[2] E05B *67/02;* E05C *19/08*
U.S. Cl. 70—52 **15 Claims**



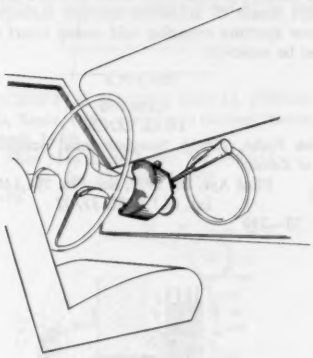
1. A high security padlock for securing in locked condition a pair of companion locking bars having ends providing apertured hasp portions to be locked together in parallel, laterally alined abutment, the padlock comprising a strong penetration and distortion resistant padlock body having a rearwardly opening cavity bounded by a pair of laterally spaced vertical bounding wall surfaces to receive the alined abutting hasp portions therebetween in enshrouded relation shielded by the padlock body against access by attacking tools directed from the front, sides, or bottom of the lock body, the padlock including a shackle having a portion movable from a locking position extending transversely through the cavity and through the apertures of the abutting hasp portions therein and a retracted position enabling withdrawal of the hasp portion from the cavity, a lock mechanism within the padlock body for locking the shackle in said locking position and releasing the same for movement to the retracted position; the improvement comprising a wedge-attack resisting collar member in said cavity for resisting destructive attack responsive to driving wedge-type attack tools in the zone located between the rear of the padlock and a rearwardly adjacent stationary surface of a portion of the locking bars or adjacent wall surface or the like by persons seeking destructive tearing of the padlock shackle forwardly through the hasp portions, the attack resisting collar member comprising integral bottom and side walls defining a hasp-receiving passage between the side walls to receive therethrough the laterally alined abutting hasp portions and one of said side walls providing a forwardly converging wedge portion located between the adjacent lateral surface of the adjacent hasp portion and the confronting bounding wall surface, said wedge portion having a contact surface adjacent the hasp portion and an opposite camming surface disposed adjacent and confronting the adjacent bounding wall surfaces, the collar member having a rear end portion projecting through said rearward opening for a predetermined distance beyond the rear of the lock body flanking the opposite sides of the alined abutting hasp portions into said zone to be engaged by the attacking tool when driven between the lock body and rearwardly adjacent surface, and said lock body having inclined ramp surface formations along the confronting bounding surface adjacent the wedge portion for imparting a predetermined component of lateral hasp gripping movement to the wedge portion toward the opposite bounding wall surface when the collar member is driven forwardly by the attacking tool and thereby bring portions of the padlock into increasingly tightening gripping engagement with the opposite lateral surfaces of said hasp portions for resisting destructive tearing and withdrawal of the hasp portions from the cavity.

4,104,895

VEHICLE STEERING COLUMN IGNITION LOCK PROTECTIVE DEVICE

Lawrence Tankel, West Roxbury, Mass., assignor to Car Cuf Industries, Inc., Brookline, Mass.

Filed Apr. 11, 1977, Ser. No. 786,071
Int. Cl.[2] E05B *17/14*
U.S. Cl. 70—237 **2 Claims**



1. A vehicle steering column lock protective device comprising:
a casing having a base, first and second parallel sidewalls affixed to said base, and first and second ends affixed to said base and said sidewalls;
a u-shaped shackle having a first and second end, the first end of said shackle pivotally mounted at the first end of said casing, and at least one shackle aperture defined within said shackle in proximity to said shackle's second end;
said casing having defined therein an ignition key lock receptacle area in a central portion thereof between said sidewalls, a shackle insertion slot centrally located in the base of said casing proximal to said casing's second end, a casing insert aperture proximal to said casing's second end and adjacent to said second sidewall, a lock receipt aperture in said first sidewall proximal to said casing's second end, a female receptacle slot in said base at the bottom of said casing insert aperture, a screw aperture in said second sidewall adjacent to said casing insert aperture, and a gearshift receptacle slot formed by an angular indentation in said casing and first sidewall proximal to said casing's second end below said lock receipt aperture and to the side of said shackle insertion slot;
a casing insert adapted for insertion into said casing insert aperture;
a lock member of the push-to-lock, key release type having a lock bolt and lock flange member, said lock member adapted to be inserted within said lock receipt aperture

from the direction of said casing insert aperture when said casing insert is not inserted therein, said lock bolt and lock flange facing said casing insert aperture, said lock flange adapted to be affixed to a portion of said first sidewall adjacent said casing insert aperture;

lock flange means for affixation of said lock flange to said casing, the mechanical fastening of said lock flange means for affixation effected through said screw aperture; and

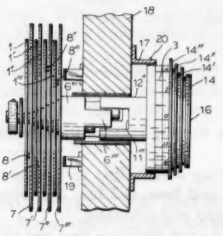
said casing insert further having a male extension portion at its base adapted to mate with said female receptacle slot at the bottom of said casing insert aperture, said casing insert further having defined therein a bolt receiving aperture and a screw receipt aperture, said casing insert being adapted for insertion into said casing insert aperture so as to be spaced apart from said lock flange a distance sufficient to allow said shackle to pass there between with said bolt receiving aperture opposite said lock bolt; and after said insertion, said casing insert to be affixable in position by casing insert means of affixation inserted through said screw aperture in said second sidewall engaging into said casing insert's screw receipt aperture so that when said shackle is in a closed position and said push-to-lock, key release lock is depressed, said lock bolt passes through said shackle aperture and into said bolt receiving aperture of said casing insert thereby retaining said casing insert in said casing insert aperture when locked even if said casing insert means of affixation inserted through said casing screw aperture engaging said casing insert should otherwise be removed.

4,104,896

DIAL LOCK

Hee Mok Hahn, 156-36, Songbuk-dong, Songbuk-Ku, Seoul, Rep. of Korea

Filed Apr. 26, 1977, Ser. No. 791,145
Int. Cl.[2] E05B *37/02*
U.S. Cl. 70—310 **2 Claims**



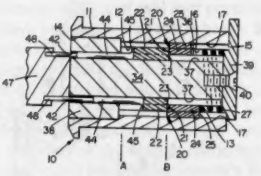
1. A dial type combination lock comprising a plurality of locking units, each locking unit having a locking means comprising a leading disc having a plurality of holes around the outer edge thereof corresponding to a series of indicia and a connecting shaft projecting from the center thereof, and a locking disc rotatably mounted on said connecting shaft and having a pin adjacent the periphery thereof and engaged in one of the holes in said leading disc and a bolt receiving notch in the outer periphery thereof, and each locking unit having a dial means comprising a cup-shaped dial having an upstanding wall and base, the wall defining an indicia carrying portion on the radial outer surface thereof and a further connecting shaft projecting from the base thereof and telescopically coupled with said connecting shaft on said leading disc so that the dial may move from an inner to an outer position relative to the locking means, an innermost one of said plurality of locking units being mounted on a central supporting shaft and successive locking units having the connecting shafts successively larger in diameter and concentric with each other, said connecting shafts being successively shorter the larger the diameter thereof, the walls of the cup-shaped dials on the successive locking units being nested in each other and the successive locking discs and leading discs of the locking units being side by side, a protecting case around the wall of the dial of the outermost dial means and having an index thereon, whereby the dials must be drawn out from their inner position to their outer position to expose the indicia carrying portion thereof, and at least one supporting member engaged with the locking disc on the outermost locking unit to prevent movement of the locking disc, said protecting case being adapted to be mounted on one side of a member to be locked and the supporting member being adapted to be mounted on the other side of the member to be locked.

4,104,897

TUMBLER LOCK

Gerald A. Freedman, c/o Fish & Richardson, Ste. 2100, 28 State St., Boston, Mass. 02109

Continuation-in-part of Ser. No. 590,334, Jun. 25, 1975, abandoned. This application Jun. 21, 1976, Ser. No. 697,936
Int. Cl.[2] E05B *29/06*
U.S. Cl. 70—363 **20 Claims**



1. A lock comprising:

a cylinder,

means for forming a tumbler chamber within said cylinder,

means for forming a keyway that intersects said chamber,

a plurality of lock tumblers located together within the same said chamber, said tumblers traveling therein from a constant misalignment arrangement through a plurality of variable misalignment arrangements to an alignment arrangement, wherein whenever said tumblers are misaligned the said lock cannot be operated and while said tumblers are aligned the said lock can be operated,

a key having a plurality of bits that can enter said keyway to contact said tumblers, and cause the same to variably travel toward said alignment arrangement,

means for dragging said travel of every said tumbler, wherein whenever said key causes said tumblers to travel toward said alignment arrangement said means for dragging is sufficient to prevent said tumblers from traveling beyond said alignment arrangement, and

means for collectively returning said tumblers from all said alignment and variable misalignment arrangements back to said constant misalignment arrangement whenever said key is removed from said keyway, wherein whenever said key causes said tumblers to travel toward said alignment arrangement one or more of said dragged tumblers travels to said alignment arrangement contacted with said means for returning and the remaining dragged tumbler or tumblers travels to said alignment arrangement spaced from said means for returning, in said constant misalignment arrangement said means for returning is in contact with all of said tumblers, and in any alignment or misalignment arrangement no tumbler is positioned between said means for returning and any other tumbler, said means for collectively returning comprising a coil spring.

4,104,898
LOCK SAFETY DEVICE

Battista Fois, via Roccella Ionica 48, Rome, Italy

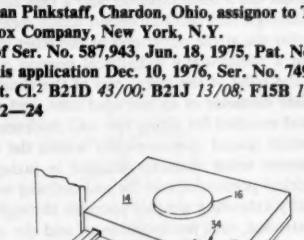
Filed Mar. 7, 1977, Ser. No. 774,966
Claims priority, application Italy, Mar. 9, 1976, 20986 A/76
Int. Cl.[2] E05B *15/08, 17/14*
U.S. Cl. 70—419 5 Claims

1. A lock safety device comprising, in combination, a rotatable lock-operating rotor having a first key slot extending transversely thereof, a non-rotatable inner member adapted for fixed securement to a door or the like; key-operable pin means interconnecting said rotor and said inner member to prevent rotation of said rotor, said pin means being operable, by a key engaged in said first key slot, to release said rotor for rotation, relative to said inner member, by the thus engaged key; a fixed outer member having a second key slot extending transversely thereof; and a rotatable diaphragm member interposed between said fixed outer member and said rotor and having a third key slot extending transversely thereof; said second and third slots normally being angularly aligned with each other and extending at an angle to said first key slot to block access to said pin members through said first key slot; said diaphragm member, upon insertion of a key through said second key slot into said third key slot, then aligned with said second key slot, being rotatable to align said third key slot with said first key slot for further insertion of the key into said first key slot to operate said pin means to release said rotor for rotation of said lock-operating rotor by the key.

4,104,899
PNEUMATIC BUFFERING SYSTEM

Carlos Dean Pinkstaff, Chardon, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 587,943, Jun. 18, 1975, Pat. No. 4,033,250.
This application Dec. 10, 1976, Ser. No. 749,561
Int. Cl.[2] B21D *43/00;* B21J *13/08;* F15B *15/22*
U.S. Cl. 72—24 3 Claims



1. A pneumatic system for controllably moving a horizontal press bolster between positions of a predetermined horizontal path comprising:

a pneumatic pressure source having a predetermined pressure level;

a linear actuator having a pair of opposed pressure chambers;

a piston movable in said linear actuator in response to the pressure difference in the opposed pressure chambers of said linear actuator, said piston being coupled to the press bolster to move the press bolster with movement of said piston;

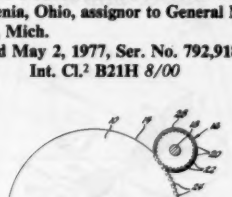
sensing means for detecting the position of the press bolster along the predetermined path and establishing control signals indicative thereof; and

valve means responsive to the control signals of said sensing means for sequentially applying said predetermined pressure level from said pressure source firstly to only one of the opposed pressure chambers of said linear actuator while exhausting the other of the opposed pressure chambers to quickly drive the press bolster through a first portion of the predetermined path, secondly applying said predetermined pressure level from said pressure source to both of the opposed pressure chambers of said linear actuator without exhausting the other of the opposed pressure chambers to buffer the speed and momentum of the press bolster through a second part of the predetermined path and thirdly exhausting only the other pressure chamber of said linear actuator to drive the press bolster through the remaining part of the predetermined path to quickly close it without causing a shock to the bolster and press.

4,104,900
PROCESS FOR MAKING METAL FIBERS

Terry E. Nels, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1977, Ser. No. 792,918
Int. Cl.[2] B21H *8/00*
U.S. Cl. 72—70 4 Claims



1. A method of making metal fibers of predetermined size comprising;

impressing a knurled pattern on a working surface of a metal workpiece the pattern comprising a series of alternate ridges and depressions, the length and width of said ridges corresponding respectively to the desired length and width of said fibers and the depth of said depressions being at least as great as the desired thickness of said fibers, and

shaving said ridges from said working surface at a suitable depth to form said fibers having the desired thickness and to expose a new working surface.

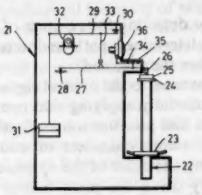
4,104,901
HARDNESS TESTING MACHINE

Joseph Trevor Sidaway, 138 Leavale Rd., Norton, Stourbridge West Midlands, England

Filed Oct. 14, 1976, Ser. No. 732,475
Claims priority, application United Kingdom, Oct. 16, 1975, 42405/75
Int. Cl.[2] G01N *3/44*
U.S. Cl. 73—81 9 Claims

1. In a hardness testing machine having a support for an object which is to be tested, an indenter which, in use, forms an indentation in the object, an indenter lever on which the indenter is mounted and a mechanism for urging the indenter

against the object under test, the improvement wherein the indenter lever is arranged for applying a preliminary load to the indenter to urge same against the object, said mechanism includes means for exerting an additional load on the indenter and the machine further comprises a clamp for applying a load



substantially equal to the additional load to an object on the support prior to application of the additional load to the indenter, and means operative for transferring said applied additional load from said clamp to said indenter and thereby applying the additional load by the indenter to the object and relieving the object of the load applied thereto by the clamp.

4,104,902

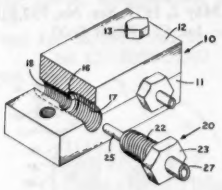
FERRULE FORMING ASSEMBLY

James W. Cease, Phillipsburg, N.J., assignor to Robert H. Fine, Milford, N.J.

Filed Jun. 29, 1977, Ser. No. 810,957

Int. Cl.² B21D *41/02*

U.S. Cl. 72—117 **4 Claims**



1. An assembly for forming a ferrule on a tubular member comprising,

a. housing means,

b. at least one sized transverse bore extending end to end in said housing and having at least one opening in the side of said housing to permit the tubular member to be inserted therethrough a predetermined distance so as to position the same in the transverse bore as a function of the position where the ferrule will be formed thereon,

c. said transverse bore has a first sized section to hold the tubular member from slipping in assembled position for forming the ferrule thereon, a second counter-bored section in alignment with said first sized section, and a fixed contoured annular die surface formed medially in said transverse bore between the first sized section and the second counter-bored section,

d. said second counter-bored section threaded for a portion of the length thereof a spaced distance from the fixed annular die surface,

e. a ferrule forming element having, an inner end, an outer end, and threaded means thereon for threadably connecting the same in the threaded section of said second counterbored section to permit movement thereof in the transverse bore towards and away from the fixed annular die surface, and said ferrule forming element in assembled position in said second counter-bored section to define a lubricant space adjacent the fixed annular die surface,

f. said sized section having a plurality of spaced annular channels to provide a labyrinth seal on the side of the fixed annular die surface remote from the lubricant space to limit leakage of the lubricant from the transverse bore during formation of the ferrule on the tubular member,

g. said ferrule forming element having a contoured mating die surface at the inner end thereof to coact with the fixed annular die surface on movement of the ferrule forming element so as to form the shaped ferrule on the tubular member, and

h. means at the inner end of the ferrule forming element for engaging the end, the outer surface, and the inner bore of the tubular member to permit uniform force to be exerted on the end of the tubular member during formation of the ferrule thereon.

4,104,903

APPARATUS FOR EXTRUSION OF TUBES

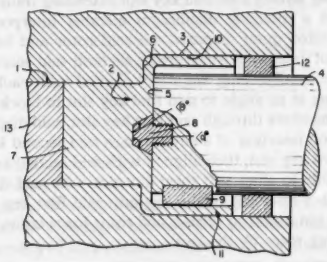
Douglas W. Rowell, Woodbury, Conn., and Werner Rethmann, Georgsmarienhuette, Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshuette AG, Fed. Rep. of Germany

Filed Mar. 30, 1977, Ser. No. 782,773

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613684; Mar. 31, 1976, 2613685; Mar. 31, 1976, 2613686; Apr. 30, 1976, 2619047

Int. Cl.² B21C *23/08, 25/08, 26/00*

U.S. Cl. 72—264 **4 Claims**



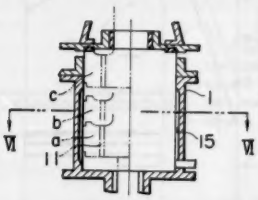
1. In an extrusion press for producing an extruded tube wherein said press has a billet chamber and a ram adapted to drive a billet through said billet chamber, sizing means comprising an annular die at the outlet end of the billet chamber, said die having a substantially cylindrical portion of larger diameter than the billet at the outlet end of the chamber for sizing the outside diameter of an extruded tube, and an elongated cylindrical mandrel for sizing the wall thickness of the tube, said mandrel spaced concentrically within the die and having a maximum sizing diameter situated in juxtaposition with the cylindrical portion of said die and defining with said die a horizontally extending annular aperture through which said billet is extruded, said juxtaposition of said die and said mandrel being such that said billet is extruded outwardly away from said mandrel until it abuts said cylindrical portion of said die and then forms an extruded tube having an inside diameter greater than the maximum sizing diameter of said mandrel; the improved contruction characterized by said mandrel comprising a cone shaped annular insert extending into said die from the front face of the mandrel, said mandrel further being provided with an arcuate insert mounted partially within said mandrel in the area of the lower longitudinal surface thereof, such arcuate insert being dimensioned in the circumferential direction so as to correspond to that of at least one half of the circumference of said mandrel and having a radial protrusion from the mandrel face that is supported by the inner wall of the extruded tube during the extrusion operation.

4,104,904

HIGH-ENERGY RATE FORGING MACHINE

Hiroyasu Yaguchi, Muroran, and Eishiro Ono, Noboribetsu, both of Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Aug. 24, 1976, Ser. No. 717,434
Claims priority, application Japan, Feb. 19, 1976, 51-16533
Int. Cl.[2] B21J 7/24
U.S. Cl. 72—445 2 Claims



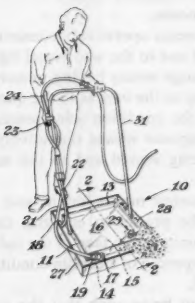
1. In a high-energy rate forging machine of the type including a piston fitted to reciprocate in a cylinder and having small holes longitudinally therethrough connecting the space above and below said piston within said cylinder, and means for connecting a high pressure gas with the said above space, the improvement comprising; a plurality of small groove means provided longitudinally in the inner peripheral wall of said cylinder at positions therein arranged to provide communication between said spaces at least when said piston is at the bottom of its stroke and arranged to not provide communication at least when said piston is at the top of its stroke, said groove means passing a negligable amount of gas during the downward stroke of said piston so that there is a negligable effect on stamping and, said groove means providing for equilibrium between the high-pressure chamber and the low-pressure chamber after stamping to prevent double or triple stamping, and providing a smooth upward return stroke.

4,104,905

LEAK DETECTING APPARATUS

Richard E. Zachary, Ethel, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 13, 1976, Ser. No. 750,067
Int. Cl.[2] G01M 3/06
U.S. Cl. 73—40 6 Claims



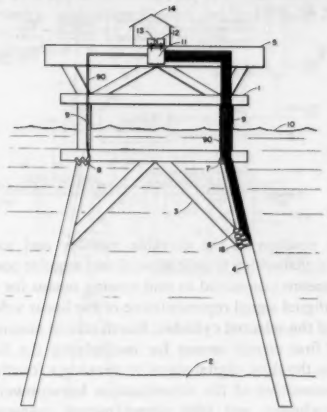
1. An apparatus for the testing of a generally horizontally disposed water-impermeable membrane, the apparatus comprising a hollow housing, the hollow housing having an upper end and a lower end, the upper end being closed and having an transparent portion, the lower end being open and having disposed thereabout a flexible sealing member adapted to engage a membrane being tested, the hollow housing defining an inner cavity in full communication with the open end, a gas discharge means disposed adjacent the upper end of the housing, and a water inlet means within the housing in communication with the cavity, an ejector in operative combination with the gas discharge means, a selective valving means to selectively (a) supply water to the water inlet means or (b) supply water to the ejector to thereby exhaust air from the cavity or (c) prevent flow of water to the water inlet means or the ejector, a liquid ballast receiving means being a trough peripherally disposed about and affixed to the hollow housing.

4,104,906

EARLY CRACK DETECTION WITH MULTI-PRESSURE SYSTEM

Donald H. Oertle, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Apr. 4, 1977, Ser. No. 784,193
Int. Cl.[2] G01M 3/02
U.S. Cl. 73—104 44 Claims



33. An apparatus for the early detection of the formation of a crack in a non-permeable, structural member subject to stress before the crack traverses the member, the apparatus comprising:

(a) a first vacuum source,

(b) a first vacuum sensor,

(c) a vacuum tight line connecting the first vacuum source and the vacuum sensor,

(d) a patch sealed in vacuum tight relationship to the line, the patch comprising a first permeable cavity adjacent to the end of the first vacuum line and to the structural member, the patch further comprising a second cavity adjacent to the structural member but sealed from the first cavity, the second cavity sealed to a line providing fluid communication with a second pressure source.

4,104,907

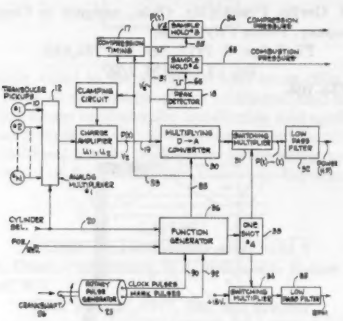
INDICATED HORSEPOWER MEASUREMENT SYSTEM FOR PISTON ENGINES

Panayiotis J. Tsipouras, Rocky River, Ohio, assignor to Megasystems, Inc., Cleveland, Ohio

Filed Oct. 26, 1976, Ser. No. 735,591
Int. Cl.[2] G01M 15/00
U.S. Cl. 73—117.3 8 Claims

1. An electronic measurement system for monitoring and measuring the operating parameters of a multi-cylinder engine having a cyclically drivable member connectable to all pistons of said engine, comprising transducer means for sensing the internal cylinder pressure in each cylinder of said engine and providing a first signal representative of the change in pressure therein, first circuit means for providing a first voltage signal

proportional to the pressure changes in a selected cylinder under examination, first switch means connected between said transducer means and first circuit means for sequentially connecting the transducer means of each selected cylinder to said first circuit means to enable the selected cylinder examination whereby said first voltage signal is provided for each said selected cylinder, second circuit means in circuit with said first circuit means and operable to sample the first voltage signal at predetermined intervals of time and to develop a second voltage signal which is applied to the first circuit means effective to modify the first voltage signal so that it is proportional to absolute pressure, means for continuously sensing the relative



angular position of the drivable member and to provide a second signal which is indicative of said angular position, third circuit means connected to said sensing means for developing a third digital signal representative of the linear velocity of the piston of the selected cylinder, fourth circuit means connected to said first circuit means for multiplying the first voltage signal by the third digital signal to develop a fourth signal that is representative of the instantaneous horsepower of the selected cylinder, and fifth circuit means connected to said fourth circuit means for averaging the fourth signal and to provide a second voltage signal that is representative of the indicated horsepower of the selected cylinder.

4,104,908

BORE STRESS LIMIT INDEX

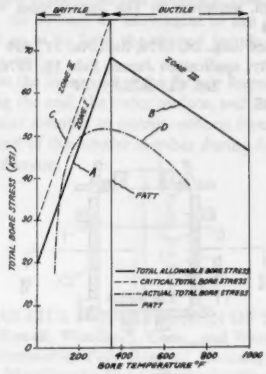
Dominic P. Timo; Ronald J. Placek; David C. Gonyea, all of Schenectady; Lloyd H. Johnson, Scotia, and Jens Kure-Jensen, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 20, 1977, Ser. No. 843,965
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—117.3 **16 Claims**

1. In a turbomachine wherein certain turbomachine parts may be assigned allowable stress values based upon the operating temperature of the turbomachine; wherein the allowable stress values are a function of whether or not the machine operating temperature is above or below a transition temperature; a method for monitoring stress excursions within the turbomachine parts wherein the actual stress value may exceed allowable stress values comprising the steps of:

comparing the turbomachine operating temperature with the transition temperature;

counting stress excursions occurring below the transition temperature in at least one counter; and,



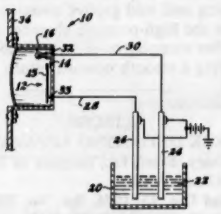
counting stress excursions occurring above the transition temperature in at least one other counter.

4,104,909

COMBINATION GAUGE

Wayne R. Ayers, R.R. 4, Box 218, Noblesville, Ind. 46060

Continuation-in-part of Ser. No. 740,598, Nov. 10, 1976, abandoned. This application Jul. 21, 1977, Ser. No. 817,603
Int. Cl.[2] G09F *9/00*
U.S. Cl. 73—118 **10 Claims**



1. A combination gauge for indicating a measured condition, comprising, in combination:

a visual light means;

first response means operatively connected to the condition being sensed and to the said visual light means;

an indicator gauge means having numerals or other indicia for specifying to the user as to the quantity or other characteristic of the condition being sensed;

and second response means operatively connected to the condition being sensed and to the said indicator gauge means;

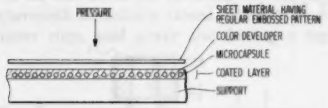
energization control means for the said visual light means, adapted to be pre-set to energize the said visual light means to illuminate the face of the indicator gauge means upon the happening of a certain condition of the condition being sensed;

the arrangement being such that the said indicator gauge means is operative to specify its sensed data to the user during various conditions of the condition being sensed, and the said visual light means is operative to be energized to give its sensed data condition signal to the user by illuminating the face of the indicator gauge means during operativity of the said indicator gauge means but only when the condition being sensed reaches a pre-selected condition which has been pre-set into the said energization control means for the said visual light means.

4,104,910
PRESSURE MEASURING METHOD

Yasuhiro Ogata, and Noburo Hibino, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami ashigara, Japan

Filed Jan. 18, 1977, Ser. No. 760,306
Claims priority, application Japan, Jan. 20, 1976, 51-5180
Int. Cl.[2] G01L *1/00*
U.S. Cl. 73—141 R 9 Claims

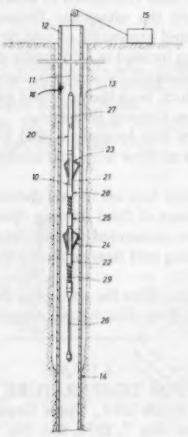


1. In a pressure measuring method in which a pressure applied to a part or parts is detected by applying the pressure to the part or parts using a pressure-sensitive recording sheet on which the color density formed is related to the pressure applied and which is in contact with said part or parts and evaluating the color density formed, the improvement which comprises applying the pressure while interposing a sheet material having regular embossed patterns between said part and said pressure-sensitive recording sheet.

4,104,911
METHODS AND APPARATUS FOR DETERMINING THE STUCK POINT OF A CONDUIT IN A BOREHOLE

Jean C. Lavigne, Chevreuse, and Yves Nicolas, Versailles, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,194
Claims priority, application France, Sep. 28, 1976, 76 29054
Int. Cl.[2] E21B *47/00*
U.S. Cl. 73—151 27 Claims



1. A method for determining at least approximately a remote location at which a string of pipe may be stuck in a well bore and comprising:

moving a deformation-responsive sensor to a selected depth location within said pipe string and anchoringly engaging the upper end of said sensor to an upper wall surface of said pipe string which is then adjacent to said upper sensor end;

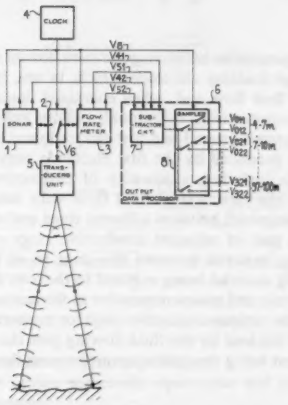
anchoringly engaging the lower end of said sensor to a lower wall surface of said pipe string which is then adjacent to said lower sensor end only after said upper sensor end has been anchoringly engaged; and

thereafter, upon application of a force to the surface end of said pipe string, monitoring output signals from said sensor for detecting whether a corresponding deformation is then being induced in the incremental length of said pipe string between said upper and lower wall surfaces thereby demonstrating that said incremental length of said pipe string is at least partially situated above said remote location.

4,104,912
SYSTEM FOR TAKING CURRENT-METERING MEASUREMENTS

Noël Clavelloux; Francois Peynaud, and Gilles Posseme, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation-in-part of Ser. No. 700,157, Jun. 28, 1976, abandoned. This application Mar. 30, 1977, Ser. No. 782,701
Claims priority, application France, Jul. 1, 1975, 75 20646
Int. Cl.[2] G01W *1/00*
U.S. Cl. 73—189 9 Claims



8. A liquid flow rate metering system on board comprising, in cooperation:

a flow rate meter (3), based on Doppler effect for providing relative measurements of currents through a liquid medium,

a Doppler sonar system (1), for determining the speed of moving craft in relation to the liquid bottom and further for correcting said flow rate relative measurements,

a controlled switching means (2), for sequentially connecting said meter and said sonar system alternately to a single acoustic unit (5),

a control means (4) for controlling said switching means operation and for actuating sequentially in turn the meter and the sonar system actually connected to said acoustic unit,

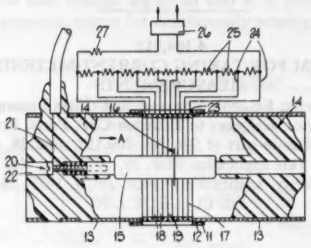
the said acoustic unit (5) comprising groups of electroacoustic transmitting and receiving transducers mounted within a fluid medium filled sealed casing, which is inclined in relation to the vertical beam axes oriented towards acoustic waves transparent casing base in contact with craft supporting liquid medium, the velocity of acoustic waves in the filling fluid being controllable by regulated and adjustable temperature of said fluid,

whereby the difference between the measured flow rate and the determined speed of the craft provides at the output of a data processing device (6) a true flow rate in magnitude, direction and relative layer distribution.

4,104,913
APPARATUS FOR MEASURING THE MASS FLOW OF A FLUID

Charles Peter Cockshott, Balsall Common, and John Howard Moore, Redditch, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Mar. 22, 1977, Ser. No. 780,154
Claims priority, application United Kingdom, Apr. 8, 1976, 14233/76
Int. Cl.[2] G01F *1/56*
U.S. Cl. 73—194 F 5 Claims

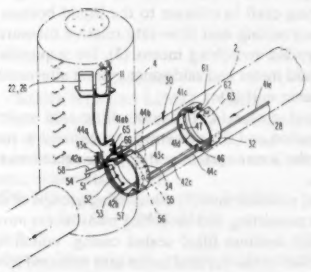


1. Apparatus for measuring the mass flow of a fluid, comprising a first ionizing electrode which, in use, is located in the path of fluid flow and, when energized, ionizes said fluid, a second substantially cylindrical, hollow collector electrode which extends around said first electrode and to which, in use, the ions produced by the first electrode migrate, the second electrode including a plurality of conductive rings spaced apart in the direction of fluid flow with insulating material being interposed between adjacent rings and at least one ring of each pair of adjacent conductive rings overlapping the insulating material between the rings so as to prevent said insulating material being exposed to the ions migrating to the rings in use, and means responsive to the amount of ion migration to the various conductive rings for measuring the displacement of the ions by the fluid flowing past the electrodes, displacement being dependent upon the mass flow of said fluid.

4,104,914
FLOW MONITORING

Charles A. McClure, 5 Laurel Cir., Malvern, Pa. 19355

Filed Sep. 20, 1976, Ser. No. 724,979
Int. Cl.[2] G01F *1/00*
U.S. Cl. 73—194 F 7 Claims

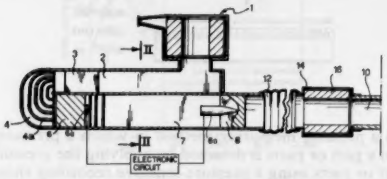


1. In a probe for sensing electrical conductivity within the open end of a conduit, the combination of support means compressible to fit within the conduit and expansible to be retained frictionally against the inside wall thereof, a plurality of conductivity sensors supported thereby at opposite sides relative to a longitudinal vertical bisector of the conduit, and jet means spaced longitudinally from the sensors for connection to electrically conductive fluid and thereby adapted to release such fluid into the conduit.

4,104,915
ULTRASONIC DEVICE FOR THE DETERMINATION OF THE RATE OF AIR FLOW IN THE INLET DUCT OF AN INTERNAL COMBUSTION ENGINE

Massimo Husse, Turin, Italy, assignor to FIAT Societa per Azioni, Turin, Italy

Filed Jul. 7, 1977, Ser. No. 813,740
Claims priority, application Italy, Jul. 9, 1976, 68718 A/76
Int. Cl.[2] G01F *1/66*
U.S. Cl. 73—194 A 1 Claim



1. A device for determining, by ultrasonic means, the rate of air flow in the inlet duct of an internal combustion engine, comprising:

a detector duct of generally rectangular cross section,

two piezo-electric transducers of ultrasonic type situated at respective opposite ends of said detector duct,

an electronic circuit connected to the outputs from said ultrasonic piezo-electric transducers, said electronic circuit operating to determine the air flow rate from the output signals from said ultrasonic piezo-electric transducers,

an intake duct of generally rectangular cross section extending adjacent said detector duct,

a U-shape deflector joining one end of said intake and detector ducts together,

a first acoustic filter connected to said intake duct and serving to absorb the ultrasonic frequency components of noise generated externally of said device,

a first set of fins located in said intake duct and shaped so as to render substantially uniform, across the air stream in said intake duct, both the air speed and the temperature of the air stream flowing therepast,

a second set of fins located in said U-shape deflector for diverting the air flow from said intake duct into said detector duct,

a third set of fins located in said detector duct for aligning the stream lines of fluid flowing therepast,

a flexible sleeve connected to said detector duct,

means for joining said flexible sleeve to the inlet duct of the engine, and

a second acoustic filter for absorbing the ultrasonic frequencies of noise generated by the engine itself.

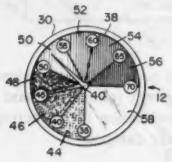
4,104,916
APPARATUS FOR TEMPERATURE MEASUREMENT

Heinz P. Hofer, South Blvd., Upper Grand View, N.Y. 10960

Filed Sep. 7, 1976, Ser. No. 720,944
Int. Cl.[2] G01K *3/00*
U.S. Cl. 73—343 B 3 Claims

1. A temperature measuring instrument for measuring the temperature of the contents of a bottle of wine comprising a thermometer including a hollow stem having an upper and lower end, a temperature sensing means positioned within said stem proximate the lower end thereof, and a temperature-indicating head secured proximate the upper end of said stem and having a calibrated scale and a pointer, said calibrated scale including a plurality of colored segments, the color of

each segment being chosen to correspond to the color of a wine and the segments being arranged on said temperature-indicating head in a manner such that the segment indicated by said pointer corresponds to the proper temperature when the color of said wine in said bottle is the same as the color indicated by said pointer, said pointer coupled with said sensing means for indicating the temperature sensed thereby, and a thermometer storing container including a hollow base having a bottom adapted to rest on a supporting surface and an open top and a cover having depending side walls constructed and arranged to fit on and close the open top of said base and cooperating therewith to define a closed chamber for storing said thermometer stem, said cover also having a top wall



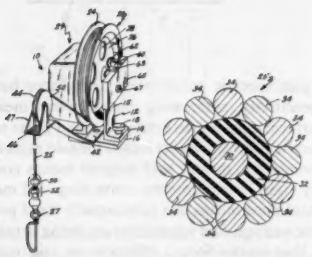
formed to receive said temperature indicating head, said top wall having a cylindrical sleeve depending from said top wall having an outside diameter selected to engage and seal the inner surface of the open end of said bottle, said sleeve having an aperture therein dimensioned to engage said stem, said engagement between said stem and said sleeve providing an air-tight seal between said top wall and said thermometer stem, the temperature of the liquid in the bottle being measured by removing said thermometer and said cover from said base and inserting the lower end of said stem into said bottle so that said sleeve enters and closes said bottle opening, thus providing a fully sealed chamber for the continued storage and measurement of the contents of said bottle of wine.

4,104,917

TROLLING WIRE

James E. Rieth, 2315 Okemos Dr. SE., Grand Rapids, Mich. 49506, and Charles J. Steffens, Wyoming, Mich., assignors to James E. Rieth, Grand Rapids, Mich.

Filed Jan. 13, 1977, Ser. No. 759,171
Int. Cl.[2] G01K *7/00*
U.S. Cl. 73—343 R **15 Claims**



1. For use in a deep trolling apparatus including a reel for raising and lowering a weighted wire with temperature detection means at one end to be immersed in water and temperature display means at the opposite end, an improved trolling wire extending between the detection and display means comprising:

a center conductor;

an insulating layer surrounding said center conductor; and

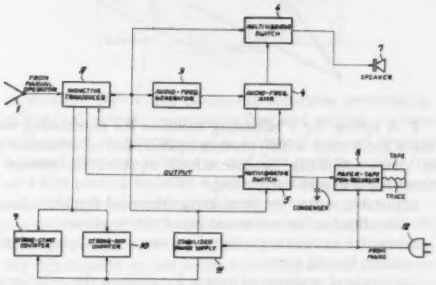
an outer conductor shield made of a plurality of strands of stainless steel, wherein the outer diameter of said outer shield is less than 0.050 inches.

4,104,918

ELECTRODYNAMOGRAPH

Aurelian Liviu Alexandru Macoveanu, and Nicolae Grecu, both of Bucharest, Romania, assignors to Institutul de Cercetari Stiintifice Pentru Protectia Muncii, Bucharest, Romania

Filed Aug. 2, 1976, Ser. No. 710,635
Int. Cl.[2] G01L *5/02*
U.S. Cl. 73—379 **3 Claims**



1. An electrodynamograph comprising:

a hand-driven device repeatedly squeezable and provided with a transducer;

a recorder operatively connected to said transducer for producing a trace of the output thereof as a function of time;

an audio-frequency generator producing an acoustic signal;

a multivibrator control switch connected to said audio-frequency generator for interrupting the signal produced thereby;

a loudspeaker connected to said multivibrator control switch for rendering the audio-frequency output audible to the test subject at a predetermined cadence, said cadence and the amplitude of the audio output of said multivibrator control switch being adjustable, said transducer comprising a primary coil and a secondary coil inductively coupled to said primary coil, and a metallic screen displaceable between said coils by said device, said audio-frequency generator applying said audio frequency signal to said primary coil to generate an audio-frequency current in said secondary coil;

a multivibrator switch of adjustable frequency connected between said transducer and said recorder for periodically interrupting the signal applied to said recorder to provide time markings on said trace; and

a first counter registering stroke-start operations of said device and a second counter registering stroke end operations of said device, said counters being controlled by two pairs of electrical contacts associated with said transducer whereby a first of said contacts is closed at the beginning of said stroke and the second of said contacts at the end of said stroke.

4,104,919
BALANCING MACHINE CIRCUIT FOR ELIMINATING UNBALANCES

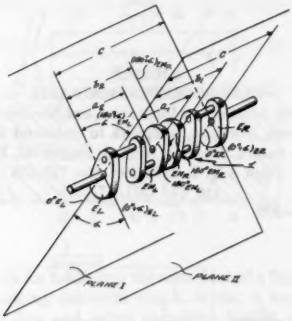
Hermann Brunnengräber, Heppenheim, Fed. Rep. of Germany, assignor to Gebr. Hofmann KG, Maschinenfabrik, Darmstadt, Fed. Rep. of Germany

Filed Jul. 16, 1976, Ser. No. 705,831

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1975, 2532597

Int. Cl.² G01M *1/30, 1/38*

U.S. Cl. 73—462 **5 Claims**



1. A circuit for a balancing machine for eliminating unbalances and a rotor which permits equalization of unbalance only in constructionally predetermined equalization planes and component angles comprising:

adjustable means for producing electrical signals indicating the distance between said equalization planes,

means for producing a signal to cause equalizing of unbalances in said rotor,

longitudinal positioning means for shifting the relative positions of said rotor and equalizing means successively in accordance with said electrical signals,

control means connecting said positioning means to said adjustable means for controlling application of said electrical signals to said positioning means,

means for generating a balance signal indicating position and angle of unbalance,

phase dependent rectifier means connected to said generating means for rectifying said balance signal and indicating non-balanceable values in equalization planes,

arithmetic circuit means connected to said rectifier means, said adjustable means, and said equalizing means for producing balance value output signals in said equalization planes and in substitute planes where balancing cannot take place in an equalization plane, and

control means connecting said arithmetic circuit means to said equalizing means for controlling said means for producing signal to cause equalizing in accordance with the output of said arithmetic circuit means.

4,104,920
PIEZOELECTRIC DAMPING MECHANISM

William Charles Albert, Boonton, and Robert Mark Hohenstein, Glen Ridge, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Apr. 1, 1977, Ser. No. 783,916

Int. Cl.² G01P *15/10*

U.S. Cl. 73—517 AV **12 Claims**

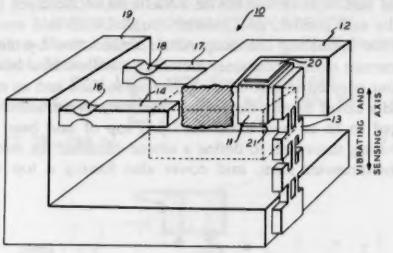
1. A vibration damping device comprising:

an evacuated housing containing said damping device,

a support,

a vibrating beam cantileveredly mounted on said support said beam being activated due to acceleration forces acting thereon,

a piezoelectric block mounted at one end to the free end of said vibrating beam and at the other end to said support for generating a source of current resulting from strain forces acting upon it due to the vibration of said vibrating beam, and



means in electrical series with said piezoelectric block for dissipating the energy released by said piezoelectric beam whereby the acceleration forces acting on said vibrating beam is effectively damped.

4,104,921
PIEZOELECTRIC ACCELERATION TRANSDUCER

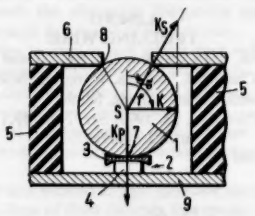
Norbert Nissl, Aresing, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,601

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556298

Int. Cl.² G01P *15/08*

U.S. Cl. 73—517 R **16 Claims**



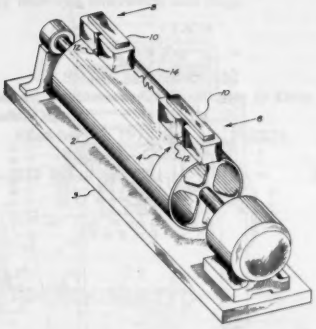
1. A piezoelectric acceleration transducer having a directional sensitivity comprising piezoelectric means having a plane surface, mass means contacting said plane surface of said piezoelectric means, support means for said mass means and for said piezoelectric means, said support means comprising substantially rigid bearing means contacting said mass means for urging said mass means in a substantially fixed position against said plane surface, said support means being arranged in such a manner that inertia forces effective on said mass means are divided between a component effective where said bearing means contact said support means and a component effective perpendicularly on said plane surface of said piezoelectric means, said bearing means between said support means and said mass means being located at directional sensitivity determining positions, wherein said support means comprise a housing including housing walls, aperture means in one of said housing walls, said aperture means having dimensions smaller than said mass means thereby forming said bearing means contacting said mass means.

4,104,922

ELECTROMAGNETIC TRANSDUCER

George A. Alers, and Robert B. Thompson, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 31, 1977, Ser. No. 801,674
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—643 8 Claims



1. An electromagnetic transducer for inducing ultrasonic waves in or receiving the waves from an electrically conductive material for use in inspecting said material as the material moves relative to the transducer, comprising:

a magnet having magnetic poles for creating a magnetic field transverse to the path of the motion; and

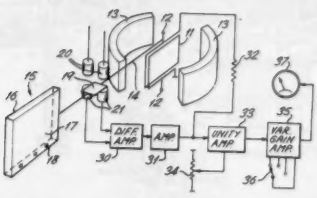
a coil positioned between the magnetic poles and in the flux path joining the poles of said magnet and centered on the side of said magnet where said magnet and said conductive material are approaching each other.

4,104,923

ULTRASONIC RADIATION BALANCE

Thomas Anthony Whittingham, Newcastle-upon-Tyne, and Michael John Farmery, Peterborough, both of England, assignors to National Research Development Corporation, London, England

Filed Aug. 24, 1977, Ser. No. 827,335
Claims priority, application United Kingdom, Sep. 3, 1976, 56652/76
Int. Cl.[2] G01H *3/12*
U.S. Cl. 73—646 5 Claims



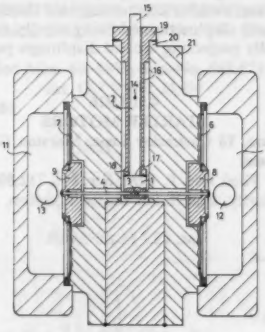
1. An ultrasonic radiation balance for testing the power of an ultrasonic transducer, comprising: a windowed vessel containing an ultrasonic transmission liquid; a balance mechanism housed in said vessel and wholly immersed in said liquid, said mechanism including a moving coil/magnet assembly and a radiation pressure sensitive member, with said coil and said member being connected for pivotal movement about a common substantially vertical axis, and with said member being located to receive radiation thereon from a transducer outside said vessel; and a servomechanism operable in response to said movement in said balance mechanism to energise said coil for movement to a null position.

4,104,924

PRESSURE DIFFERENCE MEASURING APPARATUS

Heinz Caspar; Felix Kudritzki, and Horst Ziegler, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 13, 1977, Ser. No. 796,718
Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623993
Int. Cl.[2] G01L *7/08*
U.S. Cl. 73—716 1 Claim



1. A pressure differential measuring apparatus comprising:

a cylindrical member comprising first and second portions, said second portion serving as a control rod and being of reduced diameter relative to said first portion so that that said first portion includes a surface portion which extends outwardly from said second portion;

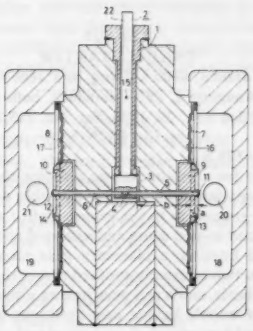
and a resilient bendable tubular member extending upwardly from said surface portion of said first portion in surrounding relationship to said second portion, said tubular member being connected to said first portion at said surface portion by a circular electron-beam-welded seam.

4,104,925

PRESSURE OR PRESSURE DIFFERENCE MEASURING APPARATUS

Heinz Caspar, and Felix Kudritzki, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,169
Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623994
Int. Cl.[2] G01L *7/08*
U.S. Cl. 73—716 5 Claims



1. An apparatus for measuring one of pressure and differential pressure comprising:

at least one diaphragm which is adapted to be responsive to said one of pressure and differential pressure, said diaphragm including first and second diaphragm portions, said first diaphragm portion having opposing outer surface portions one of which defines a diaphragm plane, and said second diaphragm portion projecting outwardly from said diaphragm plane on one side thereof;

a displacement member arranged in a first plane parallel to and on the other side of said diaphragm plane and swingable about a pivot axis which lies in said first plane

and a connecting member displaced from said pivot axis, said connecting member connecting said displacement member to said diaphragm and being rigidly fastened to said outwardly projecting second diaphragm portion.

4,104,926

STARTER MOTORS

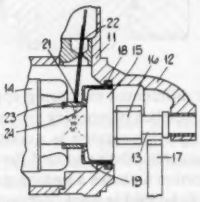
Ronald Wilson, 13 Chelmsley Lane, Marston Green, Birmingham, England

Filed Aug. 9, 1976, Ser. No. 712,809

Claims priority, application United Kingdom, Aug. 21, 1975, 34718/75

Int. Cl.² F02N *15/06*

U.S. Cl. 74—6 **2 Claims**



1. A starter motor, for an internal combustion engine, including a casing, a shaft rotatably mounted in the casing and supporting a pinion gear wheel assembly, the gear wheel assembly being rotatable with the shaft and being movable axially relative to the shaft between a rest position and an operative position, an electric motor for rotating said shaft, an annular seal secured to the casing, said seal encircling the pinion assembly a cylindrical component carried by the pinion assembly, said cylindrical component being held against rotation relative to the casing, but being movable axially with the pinion assembly, and, the inner periphery of said seal co-operating with the outer surface of said cylindrical component, said cylindrical component and said seal being so arranged that said seal remains in contact with said cylindrical component throughout the range of axial movement of the pinion assembly relative to the casing.

4,104,927

ENGINE STARTER

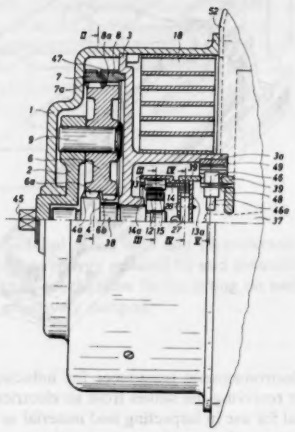
Jørn Benned Jensen, 6900 Ulfborg, and Jens Herman Jensen, Hörsholm Kongevej 1, 2970 Hörsholm, both of Denmark

Filed Nov. 29, 1976, Ser. No. 745,731

Int. Cl.² F02N *5/02*

U.S. Cl. 123—179 S **8 Claims**

1. A starter for a motor having a motor shaft, said starter comprising a stationary housing; a rotatable drum adapted to be releasably connected to the motor shaft; a spring having a first end secured to said drum and a second end secured to the inside of said housing; a planetary gear assembly including planet wheels, two internally-toothed planet rings surrounding said planet wheels, and a sun gear having a shaft section, each of said planet wheels having two toothings meshing respectively with said two planet rings, one of said planet rings connected to said housing and the other of said planet rings secured to said drum, said planetary gear assembly driving said drum; an axially extending clutch bushing adapted for permanent connection to one end of the motor shaft; and a clutch assembly including a plurality of rollers, an outer clutch portion forming a part of said clutch bushing, and a cylndrical inner clutch portion permanently connected to said sun gear shaft section, said inner clutch portion having a resilient outer friction surface, said outer clutch portion having an inner surface facing said inner clutch portion with a plurality of



recesses at regular intervals for receiving said rollers, each recess comprising a relatively large inclined surface extending towards the outer cylindrical surface of said inner clutch portion so far that the distance at the narrowest place therebetween is smaller than the diameter of said rollers; said clutch assembly engaging when said clutch bushing rotates at a speed exceeding a predetermined value and disengaging when the torque of said clutch assembly exceeds a predetermined value.

4,104,928

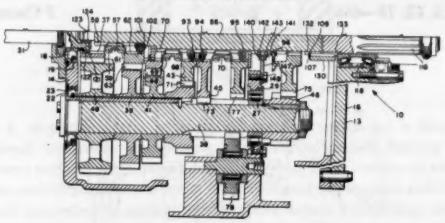
TRANSMISSION

John R. Vandervoort, Richland, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 20, 1976, Ser. No. 724,895

Int. Cl.² F16H *3/08, 57/00;* **F16D** *11/00*

U.S. Cl. 74—331 **8 Claims**



1. An improved change gear system having a main shaft, a plurality of countershafts arranged on fixed axes parallel with and substantially symmetrical about said main shaft, a gear encircling and clutchable to the main shaft which gear is adapted for simultaneous meshing with, and support by, gears positioned respectively on each of said countershafts whereby a driving relationship may be established between said countershafts and said main shaft, first means located adjacent one end of said main shaft for pivotally supporting same and second means for guiding the other end of said main shaft in a free floating relation relative to said one end and for movement at least in a direction transverse of a plane through the axes of

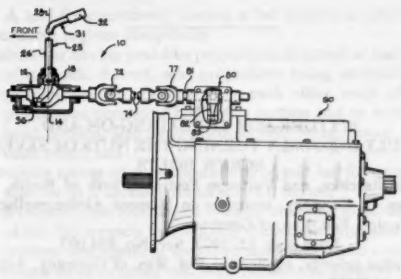
two of said countershafts, the improvement comprising: third means intermediate the ends of said main shaft for restricting axial movement thereof without restricting radial movement thereof, said third means comprising a pair of closely spaced rings axially and rotationally fixed to the main shaft and a thrust plate fixed directly to the housing, said plate having an opening therethrough for receipt of said main shaft, said thrust plate closely received inbetween said rings.

4,104,929

SHIFT MECHANISM

Leo R. Kessmar, Northwood, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed May 2, 1977, Ser. No. 793,224
Int. Cl.² G05G *9/14*
U.S. Cl. 74—473 R **24 Claims**



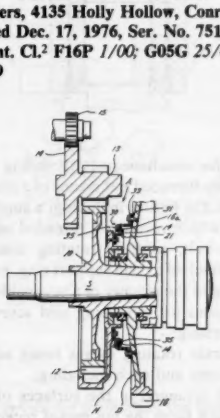
1. A shift mechanism for effecting engagement of transmission gears, said mechanism having a shift lever comprising:
a main shaft having a generally longitudinal axis, said main shaft rotatable about said main shaft axis, and
a projecting means adapted for operative association with said transmission gears, said projecting means rigidly attached to said main shaft.
the improvement wherein said projecting means comprises a second shaft rigidly attached to and radially spaced from said main shaft and wherein said second shaft generally extends at an angle to said main shaft axis.

4,104,930

FINAL DRIVE GUARD

Thomas E. Sanders, 4135 Holly Hollow, Conroe, Tex. 77302

Filed Dec. 17, 1976, Ser. No. 751,606
Int. Cl.² F16P *1/00*; G05G *25/00*
U.S. Cl. 74—609 **3 Claims**



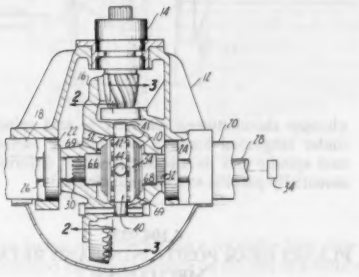
1. A wire guard for the final drive of a crawler tractor comprising:
an inner ring having an outwardly turned edge forming a U-shaped channel for receiving one edge of an outer ring; and
an outer ring having an inwardly turned U-shaped channel for receiving one edge of an inner ring, with one of said rings fixed and the other ring movable relative thereto whereby the rings form a pair of sleeves for protecting the final drive shaft from a built-up of pieces of wire.

4,104,931

POSITIVE HOLD DIFFERENTIAL

Michael G. Tomich, 20519 Catalano Dr., Mt. Clemens, Mich. 48043

Filed Mar. 19, 1976, Ser. No. 668,473
Int. Cl.² F16H *35/04*
U.S. Cl. 74—650 **8 Claims**



1. A positive locking differential for compensating for the difference in driving wheel travel comprising:
a spider member having a plurality of arcuately spaced drive teeth on opposite sides thereof;
a pair of clutch members sandwiching said spider member thereinbetween, said clutch members each having a plurality of driven teeth releasably engageable with said spider member drive teeth for transmitting torque from said spider member to said clutch members;
a plurality of arcuately spaced first cams carried by said spider member;
a plurality of arcuately spaced second cams carried by each of said clutch members and axially aligned with said spider member cams for lifting said clutch member teeth out of engagement with said spider member teeth to permit relative movement between said spider member and one of said clutch members; and
a plurality of enlarged projections and mating enlarged slots carried between said spider member and clutch members for maintaining said relative movement between said spider member and one clutch member for an arcuate distance greater than the arcuate distance between adjacent spider member cams, said enlarged projections being a one-piece construction with one of said members.

4,104,932

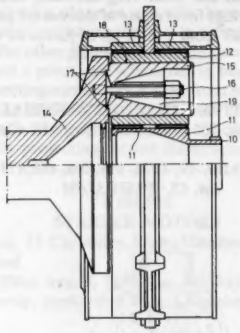
EPICYCLIC GEAR TRAINS

Hans-Erik Hansson, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Nov. 10, 1976, Ser. No. 740,522
Claims priority, application Sweden, Nov. 10, 1975, 7512553
Int. Cl.² F16H *1/28, 57/00*
U.S. Cl. 74—801 **7 Claims**

1. An epicyclic gear train, comprising:
a plurality of planet or star wheels;
a single flange holder for said wheels;
a plurality of spindles extending from said holder and supporting said wheels for rotation on said spindles, each of said spindles having an unloaded axis, a first cross section at the end of said spindle adjacent said holder and a second different, cross section at the end of said spindle remote

from said holder, each of said spindles also having a bearing surface for supporting said wheels, said bearing surface extending between said first and second cross sections, and the cross sectional area of said spindle gradually



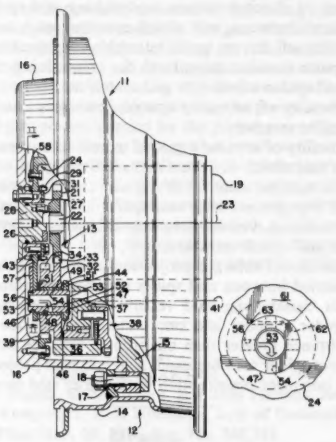
changes therebetween whereby as said spindle deforms under tangential loading, said bearing surface between said spindle and its associated wheel deforms until it is essentially parallel to said unloaded axis.

4,104,933

PLANET GEAR POSITIONING AND RETAINING MECHANISM

John J. Campbell, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 19, 1976, Ser. No. 743,383
Int. Cl.² F16H *1/28, 3/44;* F01M *9/00*
U.S. Cl. 74—801 **10 Claims**



1. Planet gear positioning and retaining means for a planetary gearing system comprising:

a planet gear carrier disposed for rotation about a primary axis and having an axle pin-receiving bore defining a secondary rotary axis which is parallel to said primary axis and spaced therefrom and which orbits around said primary axis as said carrier revolves therearound,

at least one planet gear supported on said carrier for rotation about said secondary axis and for orbiting movement around said primary axis, said planet gear having an axial bore therethrough aligned along said secondary axis,

housing means for retaining lubricant in the region of orbital movement of said planet gear,

an axle pin extending through said axle pin-receiving bore of said carrier and through said axial bore of said planet gear along said secondary axis for journaling said planet gear to said carrier, said axle pin having a lubricant passage with at least one radially directed outlet within said axial bore of said planet gear, said lubricant passage having at least one lubricant intake opening situated outside said axial bore of said planet gear and being directed away from the axis of said axle pin and towards the path of orbital motion of said axle pin around said primary axis, whereby the orbital motion of said axle pin forces a flow of lubricant into said intake opening and

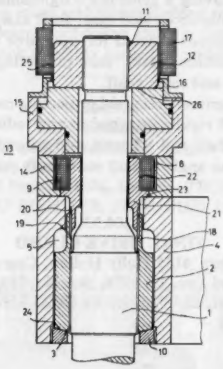
a retainer element secured to said carrier and having means for limiting angular motion of said axle pin relative to said axle pin-receiving bore of said carrier to assure that said intake opening remains directed into said path of orbital motion.

4,104,934

FIXTURE FOR THREADING-ON AND SIMULTANEOUSLY TURNING THE NUTS OF SEVERAL SCREW BOLTS

Klaus Raschke, and Volfango Festinori, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 12, 1977, Ser. No. 824,097
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638688
Int. Cl.² B25B *29/02*
U.S. Cl. 81—57.38 **10 Claims**



1. In a fixture for simultaneously threading on and simultaneously turning the threaded nut means of a plurality of screw-bolts and the like, the fixture including: a support ring having recesses each of which receives a threaded nut means and its associated screw-bolt; separate rotating means for rotating each nut means attached to said support ring, each said rotating means functioning in the manner of a reversible electric motor; and hydraulic means for stretching said screw-bolts; the improvement comprising:

each said separate rotating means being associated with a particular recess and each including:

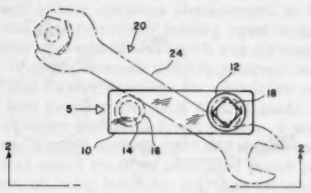
a stator part arranged in the surfaces of said particular recess which faces the nut means received by that particular recess, said stator part including an a-c winding and forming the stator portion of an asychronous-type electric motor whose rotor portion is formed by said nut means received by said particular recess.

4,104,935

FLAT WRENCH EXTENDER TOOL

Roscoe D. Stoops, P.O. Box 537, Sneads, Fla. 32460

Filed Sep. 7, 1976, Ser. No. 720,757
Int. Cl.[2] B25G *1/00*
U.S. Cl. 81—177 A 3 Claims



1. A tool for operatively turning a flat wrench in otherwise inaccessible regions comprising:

a short bar having post-like projections disposed at each end of one side thereof, said projections being essentially in parallel, spaced relationship to each other, each of said projections consisting of a body portion and an enlarged head portion, said head portions also being spaced from each other; and

coupling means on the opposite side of said bar for coupling said bar to a socket wrench driving device;

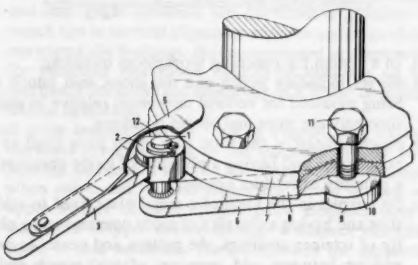
whereby said bar is arranged to allow coupling to the handle of the flat wrench by engaging the handle with said projections and applying torque to said bar via said coupling means so as to cause said head portions to hook over the handle thereby effectively preventing said tool from becoming disengaged from the wrench handle as long as such torque is maintained.

4,104,936

HOLDING-ON DEVICE

Otto Einar Sjöström, Ekedalsgatan 44 B, S-414 68 Goteborg, Sweden

Filed Oct. 26, 1976, Ser. No. 735,495
Claims priority, application Sweden, Oct. 31, 1975, 7512218
Int. Cl.[2] B25B *13/58*
U.S. Cl. 81—180 R 4 Claims



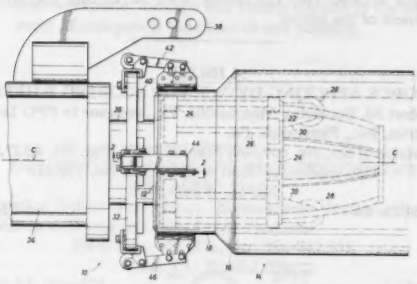
1. A holding device for facilitating the tightening of a screw joint projecting from both sides of a pair of plates, which device comprises an arm, having at one end, an organ for a torque transmitting engagement with a part belonging to the screw joint, and at the other end, a lateral stop designed to abut against an edge of at least one plate, characterized by said lateral stop comprising a pin affixed to the other end of said arm and a manually pivotable eccentric journaled on said pin.

4,104,937

PIPE CLEANING BRUSH ASSEMBLY FOR PIPE FACING MACHINE

Earl J. Breaux, New Orleans, La., assignor to J. Ray McDermott & Co., Inc., New Orleans, La.

Filed Mar. 17, 1977, Ser. No. 778,338
Int. Cl.[2] B23B *25/00*
U.S. Cl. 82—34 R 10 Claims



1. In a pipe facing machine having a rotatable face plate for forming a precision machined surface on the end of a section of large diameter pipe as it is rotated with respect to the pipe, the improvement comprising:

a pipe cleaning brush assembly mounted on said face plate for rotation therewith to clean the outer surface of the pipe proximate the end simultaneously with the machining of the end, said brush assembly including

a brush arm having a brush at one end thereof and pivotally mounted with respect to said face plate at the opposite end to permit the brush to be positioned to bear against the pipe or to be retracted from the pipe surface and

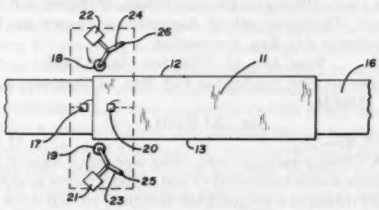
a cam at the pivotally mounted end of said brush arm for maintaining the brush arm in position when the brush is in contact with the pipe.

4,104,938

APPARATUS FOR KERFING GYPSUM WALLBOARD

Nels Nelsson, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 580,435, May 23, 1975, abandoned. This application Feb. 23, 1977, Ser. No. 771,223
Int. Cl.[2] B26D *3/06*
U.S. Cl. 83—5 1 Claim



1. An apparatus for kerfing gypsum wallboard panels along opposing edges thereof without kerfing the corners of the panels, said apparatus comprising: a moving conveyor for laterally moving gypsum wallboard panels; movable arms disposed adjacent to opposing edges of the conveyor having a

free end and a pivotally mounted end; rotatable circular saws mounted on the movable arms at the end opposite the pivot end and disposed adjacent to opposing edges of the conveyor; piston means associated with the movable arms capable of rotating the arms about the pivot end; means for sensing the movement of panels on the conveyor and in timed relationship thereto thereby actuating the piston means to rotate the movable arms causing the rotatable saws to engage and kerf the edges of the panels after the leading corners thereof have passed at least inches beyond the point of contact with the saws; and means for sensing the movement of panels on the conveyor and in timed relationship thereto thereby actuating the piston means to rotate the movable arms in a reverse manner causing the rotatable saws to discontinue kerfing of the edges at least two (2) inches prior to kerfing the trailing corners of the panels.

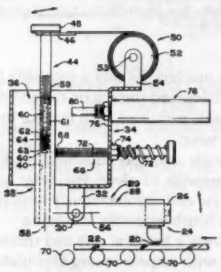
4,104,939
FORCE APPLYING DEVICE FOR SCORING WHEELS

Robert M. Bonaddio, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 669,560, Mar. 23, 1976, Pat. No. 4,027,562. This application Nov. 4, 1976, Ser. No. 738,919

Int. Cl.[2] B26D *3/08*

U.S. Cl. 83—7 **6 Claims**



1. A method of changing the predetermined applied force acting on tool means, comprising the steps of:

mounting the tool means adjacent an end of lever arm means to pivot the tool means in a first direction and in a second opposite direction along a reciprocating arcuate path;

applying a constant biasing force to the lever arm means to urge the tool means in the first direction under the predetermined applied force; and

dimensionally altering the lever arm means to change the applied force urging the tool means in the first direction.

4,104,940
NIBBLING MACHINE HAVING AUTOMATICALLY ADJUSTABLE FEED CONTROL

Eugen Herb, Ditzingen; Theodor Petera, Stuttgart, and Hubert Bitzel, Ditzingen, all of Germany, assignors to Trumpf Maschinen AG, Zug, Switzerland

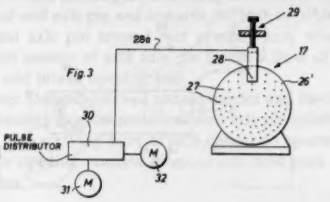
Filed Aug. 11, 1976, Ser. No. 713,495

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536524

Int. Cl.[2] B23D *27/00*

U.S. Cl. 83—71 **11 Claims**

1. A nibbling machine comprising workpiece support means, first drive means connected to said support means to move said support means in a longitudinal direction, second drive means connected to said support means to move said support means in a transverse direction, a punch engageable with the workpiece on said workpiece support to effect the nibbling thereof, third drive means connected to said punch to move said punch into and out of engagement with the workpiece on said support means, a control member movable in timed relationship to said third drive means, transmission means connected to said control member and respectively connected to said first and second drive means, said first and second drive means each including a drive motor, said control member having a control range of at least a portion of its movement corresponding to the time in which the punch is disengaged from the workpiece, said transmission means acting on said first and second drive means to control the starting, stopping and speed thereof during the



control range of said control member for varying the magnitude and direction and amount of feeding when the punch is not engaged with the workpiece, said control member and said transmission means together providing a full control of the operation of said first and second drive means in respect to starting and stopping and speed thereof during the time in which the punch is not in engagement with the workpiece.

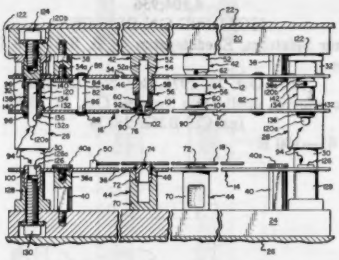
4,104,941
ASSEMBLY FOR ENABLING CLOSE TOLERANCE PUNCHING WITH A REUSABLE SYSTEM

Clarence L. Krueger, Williamsville, N.Y., assignor to S. B. Whistler & Sons, Inc., Tonawanda, N.Y.

Continuation-in-part of Ser. No. 725,259, Sep. 21, 1976, abandoned. This application Aug. 12, 1977, Ser. No. 824,155

Int. Cl.[2] B26F *1/14*

U.S. Cl. 83—133 **6 Claims**



1. In a system for punching workpieces including:

a die set including punch and die shoes, said punch shoe being mounted for vertical movement relative to said die shoe between open and closed positions;

a punch templet in the form of a metal plate fixed to said punch shoe and having a plurality of guide openings and a plurality of retainer openings;

a die templet in the form of a metal plate fixed to said die shoe and having a plurality of guide openings and a plurality of retainer openings, the pattern and center-to-center spacing between said openings of said punch and die templets being equal and associated ones of said openings of said punch and die templets being disposed in vertical alignment;

a plurality of punch parts positionally located one within each of said punch templet retainer openings, each of said punch parts including a punch fixed within its associated punch templet retainer opening and a resiliently deformable stripper device, said punch extending towards said die templet and terminating in a punch tip;

a plurality of die parts positionally located one within each

of said die templet retainer openings and associated one with each of said punch parts, each of said die parts including a die bushing formed with an opening sized and shaped to receive said punch tip of an associated punch part for effecting punching of said workpieces in alignment therewith during movement of said shoes into said closed position;

a guide templet having a plurality of guide openings and a plurality of locater openings characterized as having a pattern and center-to-center spacing equal to said guide and retainer openings of said punch and die templets;

a plurality of guide elements slidably received one within each of said locator openings for association one with each of said punch parts, each of said guide elements having an upper surface, a lower surface, a supporting portion and a guide opening sized and shaped to slidably receive said punch tip of its associated punch part, said guide elements being insertable into their associated locator openings to place said supporting portion in engagement with an upper surface of said guide templet and said lower surface relatively below a lower surface of said guide templet;

supporting means for normally suspending said guide templet from said punch shoe for vertical movement therewith while permitting movement of said punch templet relative to said guide templet when it is in a lower-operative position thereof, said guide templet being arranged horizontally intermediate said punch and die templets with each of said guide elements positionally locating said punch tip of its associated punch part within the guide opening thereof and being arranged for upper and lower surface engagement with said stripper device of its associated punch part and said workpiece arranged in alignment therewith, respectively, during movement of said punch shoe towards closed position; and

a plurality of guide assemblies, each of said guide assemblies including a guide pin having an upper end portion fixed to said punch shoe and a lower end portion, a guide sleeve fixed to said die shoe and a guide bushing, said guide sleeve and said guide bushing having centrally located guide openings sized to slidably receive said lower end portion of said guide pin, said upper end portion of said guide pin, said guide sleeve and said guide bushing being positionally located within associated ones of said guide openings of said punch, die and guide templets, respectively, characterized in that receipt of the guide pin lower end portions within their associated guide sleeve openings at least during a portion of the movement of said punch shoe towards closed position serves to vertically align said guide openings of said guide templet with said guide openings of said die templet, whereby said guide templet and said guide elements are operative to position the punch tips in vertical alignment with the openings of their associated die bushings, the improvement in combination for punching workpieces ranging in thickness up to a maximum thickness and selectivity in a single or multiple station operation:

said guide templet is in the form of a metal plate having a thickness corresponding to the thickness of said plates forming said punch and die templets, said guide templet when suspended by said supporting means spacing said upper surface of each of said guide elements from its associated stripper device through a distance essentially equal to said maximum thickness, when the supporting portions of said guide elements engage with an upper surface of said guide templets,

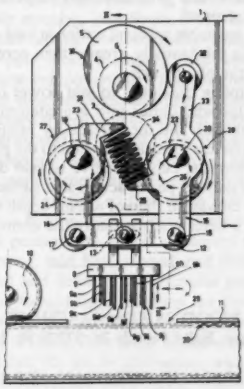
said guide pin of each of said guide assemblies is of stepped diameter having a relatively large diameter upper end portion and a lower relatively small diameter end portion, and each of said guide assemblies additionally includes a resiliently deformable stripper device arranged for opposite end engagement with said upper end portion of said guide pin and said guide bushing, said guide bushings being engagable with their associated guide sleeves during a further portion of movement of said punch shoe towards closed position to arrest movement of said guide templet relative to said die templet to define said lower-operative position of said guide templet and to initiate deformation of said stripper device of each said guide assembly, said distance between said upper surface of each of said guide elements and its associated stripper device accommodating for engagement therebetween and initiation of resilient deformation of such stripper device during movement of said punch shoe towards closed position no sooner than initiation of deformation of the stripper devices of said guide assemblies, and said punch tips being forced to move relative to said guide elements and into said openings of their associated die bushings to effect punching of said workpiece, during a still further portion of the movement of said punch shoe into closed position.

4,104,942

DEVICE FOR MANUFACTURING PERFORATED PLASTIC PIPES

Arnoldus Willem Jan Leloux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Nov. 16, 1976, Ser. No. 742,237
Int. Cl.[2] B26F *1/06*
U.S. Cl. 83—327 **7 Claims**



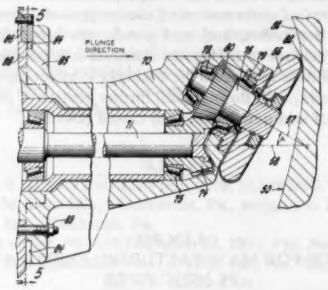
1. A device for continuously perforating plastic pipes, particularly corrugated thermoplastic pipes, comprising a tubular guide member for the plastic pipes, a pipe conveying member (**10**) for conveying the pipes, a punching member comprising a first eccentric member (**5**), eccentrics (**15,16**) cooperating with said first eccentric member (**5**) for causing the rate of advance of the punching members to proceed uniformly at the stage of punching for punching holes in the plastic pipes moving in an orbit free from said hollow tubular tube support, an actuating member (**2**) causing the punching member to act upon the pipes to be perforated, said two eccentrics (**15,16**) being interconnected via a connecting rod (**12**) carrying one or more punching members (**9**), said first eccentric member (**5**) being driven at the same rate, said device having punching member actuating means for causing the punching members to move at the same rate as the pipe conveying members (**10**), at least when the punching members act upon the pipes to be perforated, and to preserve a substantially perpendicular position with respect to the conveyed pipes when the punching members are in action, eccentrics (**15,16**) carrying saddle members (**21,25**), and a spring (**34**) being provided between the two saddle members (**21,25**).

4,104,943

CONTOUR DIE MILLING WITH A TOROIDAL CUTTER

Sergio L. Calderoni, Dearborn, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 24, 1977, Ser. No. 780,923
Int. Cl.[2] B23B *3/00*
U.S. Cl. 90—11 C **1 Claim**



1. A method of milling an arcuately contoured die surface using a three axis milling machine in which said milling machine includes a cutter support having rotatable power output means and being movable in a direction parallel to a plunge axis and simultaneously in a direction perpendicular thereto comprising the steps of:

supporting a rotatable toroidal cutter in said cutter support with its axis substantially greater than zero degrees with respect to the plunge axis,

drivingly coupling the cutter to said power output means,

feeding said toroidal cutter into a predetermined depth of engagement with the die surface by relative movement therebetween in a direction parallel to the plunge axis, and

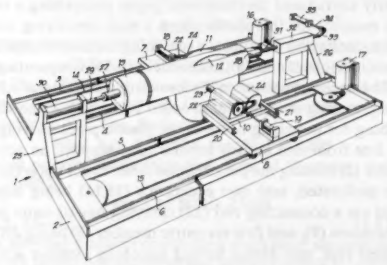
feeding said toroidal cutter relative to said die surface in a plurality of parallel passes across said surface in the direction of the curvature thereof at said depth of engagement therewith, whereby substantially the entire die surface is machined.

4,104,944

WOOD SAWING MACHINE

Raoul M. Janssen, Boite Postale 36, 97320 St. Laurent du Maroni, France

Filed Mar. 18, 1977, Ser. No. 779,011
Int. Cl.[2] B27B *7/00, 31/00*
U.S. Cl. 83—471.2 **10 Claims**



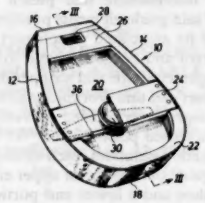
1. Wood sawing machine including a framework, at least two carriages mounted for movement on said framework, in a direction generally parallel to the longitudinal axis of said framework, control means for said carriages, at least two sleighs, each mounted for movement on a respective one of said carriages in a direction transverse to said longitudinal axis, control means for said sleighs, at least two saws each mounted on a respective one of said sleighs and having a sawing direction corresponding to said longitudinal axis, control means on each of said sleighs for driving the saw mounted thereon, two headstocks each of which is able to act upon one of the ends of a piece to be sawed, one of said headstocks being linked to a first mechanism capable of moving said one headstock along its axis and the other of said headstocks being linked to a second mechanism capable of rotating said other headstock, and a loading and unloading boom comprising a loading arm and an unloading arm mounted to rotate about a common vertical axis, said loading and unloading arms being provided with supporting means for said piece to be sawed and for a sawed piece respectively, said boom being swingable about said axis to alternately position the supporting means of said arms between said headstocks.

4,104,945

SOUND RESONATOR FOR AMPLIFYING SOUND WAVES

Gustav Georg Arne Bolin, Renstiernas gata 12, 116 31 Stockholm, Sweden

Filed Apr. 29, 1977, Ser. No. 792,371
Claims priority, application Sweden, May 13, 1976, 7605470
Int. Cl.[2] G10H *3/00*
U.S. Cl. 84—1.15 **2 Claims**



1. A sound resonator for amplifying sound waves emanating from a sound source comprising, side and end walls defining a frame, a wooden sounding board connected to one edge of said side and end walls and defining a box having an open side, said sounding board having internal and external surfaces and having grain fiber extending from one end wall to the opposite end wall so that the grain fiber is substantially parallel with said side walls, bridge means adhesively connected to said interior surface of said sounding board and extending substantially the full width thereof, a reinforcing beam extending across the open side of said box in spaced generally parallel relationship with said bridge, an electromagnet located between said bridge and said beam, said electromagnet including a coil attached to said beam and an armature connected to said bridge, said coil being connectable to a source of sound, and a plurality of wooden strips adhered to the external surface of said sounding board, said strips extending lengthwise of the grain fiber of said sounding board, said strips diverging slightly from each other and extending substantially from one end of said frame to substantially the opposite end thereof and being located in a position substantially normal to said bridge, the outermost strips substantially parallel with said side walls.

4,104,946

VOICING SYSTEM FOR ELECTRONIC ORGAN

Richard H. Peterson, 11748 Walnut Ridge Dr., Palos Park, Ill. 60464

Filed Jun. 17, 1976, Ser. No. 696,981
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.24 **23 Claims**

1. In a voicing system for an electronic musical instrument including sources of square wave signals having frequencies corresponding to the notes of a musical scale, apparatus for deriving from said square wave signals by operation of playing

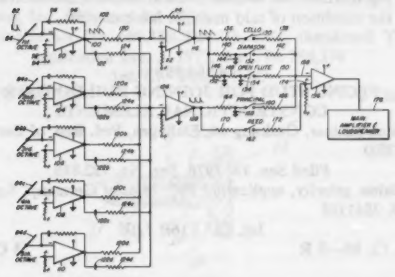
keys first and second other pulse signals of different wave shapes, both differing from a square wave, said apparatus comprising, in combination:

a plurality of player-operated keyswitches,

means including gating means connected to said sources of square wave signals for producing in response to actuation of a keyswitch a first other pulse signal of frequency corresponding to the actuated keyswitch,

means including a plurality of bus-bars each for gathering the first other pulse signals of frequencies corresponding to a selected multiplicity of notes,

a plurality of circuit means equal in number to the number of bus-bars connected one each to receive the first other



pulse signals gathered at a different one of said bus-bars and operative to convert said first other pulse signals to second other pulse signals, having a different waveform, each of said circuit means being operative to produce substantially a 6 dB per octave filtering effect throughout the range of frequencies of the first other pulse signals applied thereto and to shift the phase of all harmonics of interest contained therein by substantially 90°,

a first mixing amplifier having input and output terminals, and

means for coupling all of said circuit means to the input terminal of said first mixing amplifier whereby to produce at its output terminal second other pulse signals of frequency corresponding to the played notes.

4,104,947

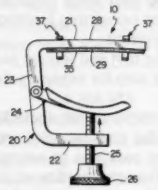
CAPO

Doran M. Oster, 1802 NE. 8th St., Gainesville, Fla. 32601

Filed Jan. 31, 1977, Ser. No. 764,264

Int. Cl.[2] G10D *3/04*

U.S. Cl. 84—318 **11 Claims**



1. An apparatus for selectively adjusting the pitch of a stringed instrument including a neck having a fingerboard with a plurality of frets spaced thereon over which the strings pass, comprising bar means extended over the strings and across the fingerboard, said bar means having upper and lower surfaces and front and rear walls, clamping means for operatively forcing said bar means toward the fingerboard, resilient string engaging means disposed along said lower surface of said bar means and adjacent said front wall, fret abutting stop means mounted on said bar means and extending downwardly therefrom, said stop means having a portion substantially in alignment with said string engaging means, whereby when said portion of said stop means abuts a selected fret, said string engaging means is in a position overlying the fret.

11. In a capo having string engaging means for use with a stringed instrument having a body with an elongated neck and a plurality of spaced frets, the improvement comprising stop means carried by said capo for engaging a selected fret and positioning said string engaging means in a selected position relative to a fret.

4,104,948

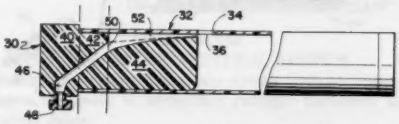
FIPPLE BLOCK FOR MUSICAL RECORDERS

George Bartholomew Young, 113 Forest Ave., Cranford, N.J. 07016

Filed May 23, 1977, Ser. No. 799,387

Int. Cl.[2] G10D *7/02*

U.S. Cl. 84—380 C **4 Claims**



1. A fipple block for use in connection with a wind instrument, said wind instrument including a hollow body, a fipple lip, and a fipple opening, said fipple block being an integral mass of material having a substantially cylindrical exterior surface, said fipple block including first, second, and third sections, said first section having a larger outer diameter than said second and third sections, said first section having a first passageway formed therein and directed at a right angle to said cylindrical exterior surface of said fipple block and adapted to receive a mouthpiece, said second section having a second passageway extending therethrough, said third section including a hollowed-out portion so that when said fipple block is inserted within a hollow body of a wind instrument, there is defined a third passageway which is adapted to terminate at said fipple opening, said first, second, and third passageways being connected and defining a continuous passageway from said mouthpiece to said fipple opening for the passage of air which operates to strike said fipple lip and cause sound waves to be produced in the hollow body of the wind instrument.

4. A fipple block for use in connection with a wind instrument, said wind instrument including a hollow body, a fipple lip, and a fipple opening, said fipple block being an integral mass of material having a substantially cylindrical exterior surface, said fipple block including first and second sections, said first and second sections having substantially equal diameters and constructed to be inserted within said hollow body, said first section having a first passageway formed therein and directed at a right angle to said cylindrical exterior surface of said fipple block and adapted to receive a mouthpiece which extends through an opening of said hollow body, said second secton having a second passageway extending therethrough and adapted to terminate at said fipple opening, said first and second passageways being connected and defining a continuous passageway from said mouthpiece to said fipple opening for the passage of air which strikes said fipple lip and causes sound waves to be produced in the hollow body of said wind instrument.

4,104,949

APPARATUS AND METHOD FOR TRANSCRIBING MUSICAL NOTATIONS

Timmy Clark, 5142 S. 1950 West, Roy, Utah 84067

Filed Mar. 8, 1976, Ser. No. 664,885

Int. Cl.[2] G01G *3/02*

U.S. Cl. 84—462 **1 Claim**

1. A system for transcribing musical notations onto paper as

the corresponding notes are played on a piano, organ, or the like, said system comprising

first means disposable on the piano above the keyboard for producing indications of the keys depressed, such indications thereby representing musical notes corresponding to the depressed keys,

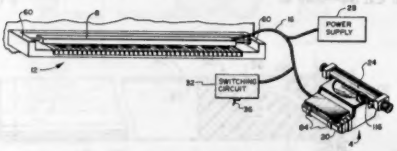
typewriter means comprising

a cylindrical, rotatable platen on which paper is rolled,

a plurality of type bars each bearing raised type representing a musical note and each actuable so that the type thereof strikes the platen at a different location thereof,

a plurality of type keys which, when depressed, actuate a corresponding one of said type bars, each type key representing a different musical note,

an electric motor, and



a universal bar disposed to be contacted and moved from a first position to a second position by the type keys when the type keys are depressed,

second means disposable on said typewriter means above the keys thereof and responsive to said indications for depressing type keys corresponding to the musical notes represented by the indications,

marking means disposed adjacent the cylindrical platen and movable longitudinally along the platen to mark paper rolled onto the platen,

means coupled to said electric motor for causing said marking means to move from a fixed position adjacent the platen in one direction longitudinally along the platen, and

means coupled to the universal bar for causing the marking means to return to said fixed position when the universal bar moves from the first position to the second position.

4,104,950

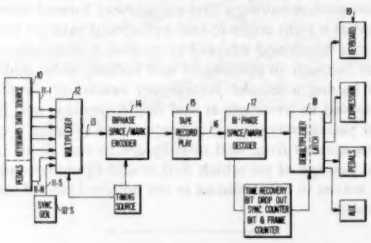
DEMULTIPLEX AND STORAGE SYSTEM FOR TIME DIVISION MULTIPLEXED FRAMES OF MUSICAL DATA

William Solon Finley, Lewisburg, Tenn., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Apr. 28, 1976, Ser. No. 681,098

Int. Cl.² G10G *3/04*

U.S. Cl. 84—462 **3 Claims**



1. Apparatus for re-creating a musical presentation on a controlled musical instrument wherein the musical presentation is digitally recorded on magnetic tape in serial order time frames of time division multiplexed data bit cells encoded in a bi-phase mark/space code comprising:

(a) means for decoding said bi-phase mark/space code;

(b) counter means for counting the decoded data bit cells;

(c) a storage shift register for storing the information in a selected sequential group of data cells within a time frame;

(d) a plurality of multiple latch circuits means, the number of latches in each multiple latch circuit equalling the number of data cells in said sequential groups;

(e) means operated by said counter means for producing and applying an enabling pulse to each of said plurality of multiple latch circuits in a selected sequence;

(f) means connecting said storage register to said multiple latch circuits for simultaneously transferring the musical data stored in said storage register to said multiple latch circuits during said enabling pulse; and

(g) means operated at the end of each time frame for operating the controls of said musical instrument according to the condition of said multiple latch circuits.

4,104,951

FIXING STUD FOR JOINING BUILDING OR CONSTRUCTIONAL ELEMENTS

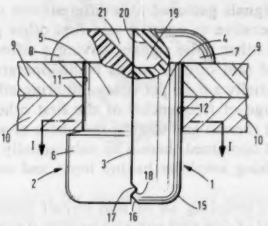
Kajetan Leitner, Öschweg 44, Eislingen, Fed. Rep. of Germany (7332)

Filed Sep. 13, 1976, Ser. No. 722,815

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1975, 2541105

Int. Cl.² F16B *5/00*

U.S. Cl. 85—5 R **5 Claims**



1. In a fastener assembly, the combination comprising:

a releasable fastening for insertion through aligned openings in plate-like structural elements from only a front-side of the elements and for securing the elements together;

first and second parts each having a length forming a front portion for projecting from a rear side of the elements, a neck portion for extending through the aligned openings, and a rear portion for projecting from a front side of the elements;

said front portion and said neck portion of the first part having cross sections permitting insertion of the first part into the aligned openings;

said rear portions of the first and second parts each including a laterally extending stop for engaging the front side of the elements;

said front portion of the first part including a laterally extending projection for engaging the rear side of the elements when the first part is in an engaging position;

said cross section of the neck portion of the first part being reduced relative to the cross section of the front portion of the first part for allowing lateral displacement of the first part to move the first part into the engaging position;

said first and second parts having mating side surfaces extending rectilinearly along their lengths to permit relative sliding movement of the first and second parts,

said front portion of the second part including a locking indentation in the side surface of the second part spaced from the neck portion of the second part for mating with the locking projection when said stop on the rear portion of the second part engages the front side of the elements whereby the first and second parts are releasably locked together without tension when the neck portions of the first and second parts are in the aligned openings;

said locking projection and said locking indentation cooperating with each other to retain the two parts in fixed longitudinal relationship defined by the laterally extending stops of the rear portions engaging the front side of the elements and the laterally extending stop on the front portion engaging the rear side of the elements; and

said two parts being in said fixed longitudinal relationship without lateral expansion of said two parts when the locking projection is mated with the locking indentation.

4,104,952

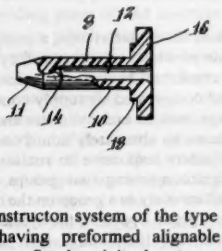
TOY CONSTRUCTION SYSTEM HAVING REUSABLE DISTENSIBLE JOINING MEMBERS

Robert L. Brass, Westport, Conn., assignor to General Mills Fun Group, Inc., Minneapolis, Minn.

Division of Ser. No. 660,320, Feb. 23, 1976, abandoned. This application Jan. 3, 1977, Ser. No. 756,274

Int. Cl.[2] F16B *19/00*

U.S. Cl. 85—5 R **3 Claims**



1. In a toy constructon system of the type including structural elements having preformed alignable holes through which fasteners are fitted to join the structural elements together, the improved fastener comprising:

a reusable rivet element formed of distensible material and adapted to fit in said alignable holes to join said structural elements together, said rivet element having an elongated body of substantially uniform cross-section throughout its length with a relaxed diameter greater than the diameter of said holes in said structural elements and a diameter, when distended longitudinally, less than the diameter of said holes, an enlarged generally coaxial base at one end of sufficient rigidity to permit said base to be held during the application of a longitudinal distending force to said rivet body sufficient to produce said lesser diameter, an internal bore extending through said base and body to the opposite end of the rivet element, said opposite end being closed and of sufficient strength to receive a longitudinal distending force, applied to the rivet element through said bore, sufficient to reduce said relaxed diameter to a diameter less than that of said holes, and a shoulder on said elongated body next to said base for spacing the base a predetermined distance from a structural element.

4,104,953

MACHINE GUN BARREL FOR FIRING BLANKS

Charles L. Bard, Rock Island, Ill., and Raymond W. Pfitzenmaier, Davenport, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 608,485, Aug. 28, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,241

Int. Cl.[2] F41F *17/08, 17/12*

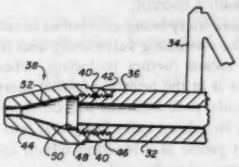
U.S. Cl. 89—14 E **4 Claims**

2. The method of making a machine gun barrel for firing blanks comprising the steps of:

a. selecting a service rejected but reclaimable barrel having a flash suppressor threadedly affixed to its outer end,

b. providing an integral one piece construction attachment having at one end thereof a bore with a first diameter of sufficient size to fit over the outer end of the barrel, the bore having a reduced diameter at the other end of the attachment, the bore having a truncated conical surface interconnecting these ends,

c. removing the flash suppressor and threadedly fastening said attachment to the outer end of said barrel, and



d. replacing the serviceable barrel of a machine gun with said service rejected but reclaimable barrel with said attachment fastened thereon.

4,104,954

HYDRAULIC CONTROL SYSTEM

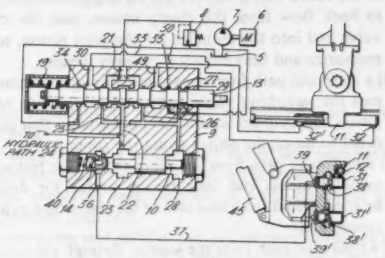
Katsuhiko Iijima, and Katsumasa Jomen, both of Sagamihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1974, Ser. No. 511,380

Claims priority, application Japan, Oct. 31, 1973, 48-122545

Int. Cl.[2] F15B *15/26*

U.S. Cl. 91—45 **2 Claims**



1. A hydraulic control system for an object moving and clamping arrangement that includes:

a support;

an object mounted on the support for movement axially therealong;

hydraulic piston and cylinder means for moving the object along the support;

hydraulically operated, releasable clamp means for locking the object at any selected position on the support, and which must be released to permit the object to be moved along the support;

a source of pressurized fluid for powering said moving means, and said clamp means;

and conduit means for communicating said source with said moving means and with said clamp means;

said control system comprising:

a switching valve interposed in said conduit means between said source and said moving means and clamps means;

the switching valve including a housing and a valve body movably mounted therein between a neutral position, and at least one activating position for effecting advancement of the object along the support;

an activator for the valve body, accessible from the exterior of the valve housing for shifting the valve body between the neutral and activating positions;

a pilot piston;

cylinder means housing the pilot piston for sliding movement therein between a first position and a second positon;

this cylinder means also housing a check valve body and means normally resiliently urging the check valve body to a first position, but being disposed to be moved to a second position by engagement with the pilot piston as the pilot piston is moved from the first position thereof to the second position thereof;

the check valve body being interposed in said conduit means between the switching valve body and the clamp means;

the conduit means further including, when the switching valve body is in the neutral position thereof:

(a) a hydraulic path from the source, through the housing, past the switching valve body and into the cylinder for the pilot piston at a location which tends to force the pilot piston away from the check valve and toward the first position of the pilot piston and tends to supply pressurized hydraulic fluid past the check valve to maintain the hydraulically operated clamp means pressurized and thus locked;

(b) a hydraulic path from the source, through the housing, past the switching valve body and back to said source, so as a by-pass for excess pressurized fluid;

the conduit means further including, when the switching valve body is in said activating position thereof:

(c) a hydraulic path from the source, through the housing, past the switching valve body and into the cylinder for the pilot piston at a location which tends to force the pilot piston towards the check valve, towards the second position of the pilot piston and the second position of the check valve, thereby permitting pressurized fluid to back flow from the clamp means, past the check valve and into the cylinder for the pilot piston, to depressurize and thus unlock the clamp means;

(d) a hydraulic path from the source, through the housing, past the switching valve body and to one side of the piston and cylinder means for pressurizing that side in order to move the object along the support;

(e) a hydraulic path from the other side of the piston and cylinder means and back to the source for draining hydraulic fluid from that side of the piston and cylinder means; and

(f) a hydraulic path from the source, through the housing, past the switching valve body and back to said source, as a by-pass for excess pressurized fluid,

the pilot piston thereby enabling the operation of only said activator to switch the object moving and clamping arrangement between one mode wherein the clamping means is locked and the object is disposed at a chosen, fixed location along the support, and another mode wherein the clamping means is unlocked and the object is moved along the support in a desired direction;

the object moving and clamping arrangement further includes at least one other hydraulically operated device;

the conduit means also communicating said source with said other device;

the control system further including:

said switching valve also being interposed between said source and said other device;

the conduit means further including, when the switching valve body is in the neutral position thereof:

(g) a hydraulic path from the source, through the housing, past the switching valve body, to said other device for powering said other device, and back to said source;

the hydraulic path (g) communicating with the hydraulic path (a) between the switching valve body and the cylinder for the pilot piston, whereby as the switching valve body is returned from said activating position to said neutral position, the flow of pressurized fluid to said other device upon activation thereof, will also aid to return the pilot piston to the first position thereof and ensure full pressurization and locking of the clamp means.

4,104,955

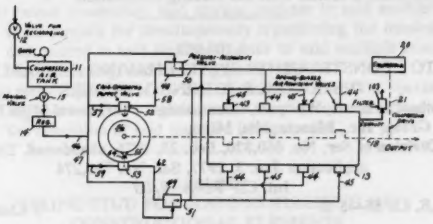
COMPRESSED AIR-OPERATED MOTOR EMPLOYING AN AIR DISTRIBUTOR

John R. Murphy, Rte. One, Smithville, Miss. 38878

Filed Jun. 7, 1977, Ser. No. 804,279

Int. Cl.[2] F01L *15/16, 25/06;* F01B *15/00*

U.S. Cl. 91—176 **6 Claims**



1. In a compressed air engine system, a compressed air storage tank, an engine provided with opposed cylinders containing pistons and a crankshaft having crank elements connected to said pistons, and compressed air supply conduit means connecting said storage tank to said cylinders and including distributing valve means to alternately admit compressed air to the respective cylinders responsive to rotation of the crankshaft, said cylinders comprising two groups, each being arranged to act simultaneously as a group on the crankshaft, with the cylinders of one group opposing the cylinders of the other group, and wherein said distributing valve means comprises respective pressure-responsive pilot valves connected between the air storage tank and the groups of cylinders and controlling the admission of compressed air to the two groups, respective relay valves connected between the air storage tank and the pilot valves and controlling the opening of the pilot valves, and cam means on the crankshaft alternately operatively engageable with said relay valves responsive to the rotation of the crankshaft.

4,104,956

RADIAL PISTON TYPE MULTI-STROKE HYDRAULIC PUMP OR MOTOR

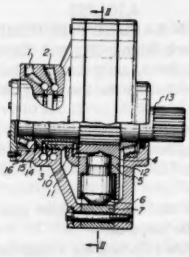
Kozo Ono, Tokyo, and Taketoshi Kato, Funabashi, both of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Japan

Continuation of Ser. No. 141,945, May 10, 1971, abandoned, which is a continuation of Ser. No. 830,622, Jun. 5, 1969, abandoned. This application Feb. 10, 1977, Ser. No. 767,338

Claims priority, application Japan, Jun. 10, 1969, 44-39401

Int. Cl.[2] F01B *13/06*

U.S. Cl. 91—491 **1 Claim**



1. A radial piston type multi-stroke hydraulic pump or motor comprising a rotor having a plurality of radially extending cylinder bores arranged about the axis thereof, a plurality of

pistons each being mounted in each of said cylinder bores for reciprocal movement therein, a cam member encircling said rotor and having a cam surface consisting of a plurality of ridges each having a same configuration, said rotor being rotatable with respect to said cam member, rolling means mounted on the outer end of each of said pistons for rolling contact with said ridges of said cam surface, and valve means for controlling the flow of fluid into and out of said cylinder bores, characterized in that when said rolling means of the piston moves from the peak to the trough of each of said ridges, the radial movement of said piston has a constant acceleration section in which the velocity of said piston continuously increases from zero to maximum with a constant rate, a constant velocity section in which the velocity of said piston is maintained at said maximum, a constant deceleration section in which the velocity of said piston continuously decreases from said maximum at the end of said constant velocity section to zero with a constant rate, and in conjunction with at least either or both of the starting point of said constant acceleration section and the ending point of said constant declaration section dwell sections in which said piston is deactivated, said acceleration section being larger than said deceleration section, and characterized in that the angular displacements θac and θdc of the piston corresponding to said constant acceleration section and said constant deceleration section respectively are multiples $m \cdot n$ and m of the piston phase differential angle $\theta_p(=2\pi/M \cdot N)$, where M and N are integers, the angular displacement θcv of the piston corresponding to said constant velocity section is a multiple l, which is an integer or zero, of the piston phase differential angle θ_p, and the sum $\epsilon_1 + \epsilon_2$ of the angular displacements corresponding to said swell sections is determined in accordance with the following equation:

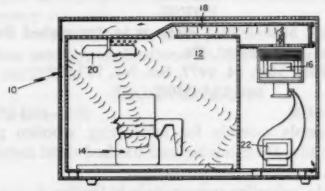
$$\epsilon_1 + \epsilon_2 = \{(M/2) - m(n + 1) - l\}\theta p,$$

where M is the number of pistons and N is the number of peaks of the cam.

4,104,957
MICROWAVE COFFEE MAKER

George Freedman, Wayland, and Robert F. Bowen, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jul. 5, 1977, Ser. No. 813,035
Int. Cl.[2] A47J *31/057*
U.S. Cl. 99—283 10 Claims

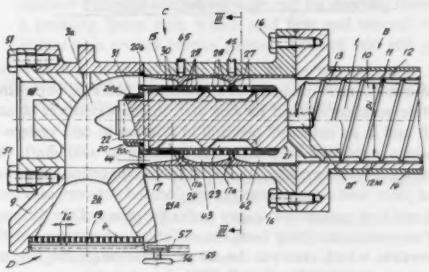


1. A drip-type coffee making appliance for use in a microwave oven comprising a pot having an open upper end, a microwave-transparent reservoir removably seated on the open upper end of the pot for containing water to be heated, said reservoir being transparent to microwave energy and having a bottom wall, a thermal valve sealed within an aperture in said bottom wall and including a valve seat positioned for contact by said water a container removably positioned beneath the valve for holding coffee grounds to be contacted by water passing from the reservoir through the valve to the pot, and means for shielding said thermal valve from microwave energy whereby the valve will operate only in response to changes in temperature of the water.

4,104,958
METHOD AND APPARATUS FOR PROCESSING VEGETABLE FOODSTUFFS

Josef Manser, Uzwil, and Friedrich Egger, Niederuzwil, both of Switzerland, assignors to Gebrueder Buehler AG, Uzwil, Switzerland

Filed Jul. 29, 1975, Ser. No. 600,112
Claims priority, application Switzerland, Aug. 1, 1974, 10612/74
Int. Cl.[2] A23P *1/00*
U.S. Cl. 99—355 29 Claims



1. An apparatus for processing a foodstuff, said apparatus comprising:

a housing defining a substantially closed flow path having an upstream path end and a downstream path end;

means supplying said foodstuff in loose condition to said upstream path end;

a screw along said path having an upstream screw end at said upstream path end and a downstream screw end spaced downstream therefrom;

kneading drive means rotating said screw and thereby kneading and pressurizing said foodstuff and feeding same in kneaded and pressurized condition to said path at said downstream screw end, whereby said foodstuff in pressurized condition will fill said path and advance therealong toward said downstream path end during rotation of said screw;

a mincing unit in said housing along said path between said downstream screw end and said downstream path end, said mincing unit including

a hollow cylindrical stator;

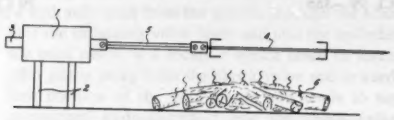
a rotatable comminuting knife closely surrounded by said stator and formed with a plurality of sets of apertures spaced apart from said upstream toward said downstream path end with the furthest downstream set having a predetermined combined cross-sectional area, and

mincing drive means connected to said knife for displacing same and comminuting the pressurized and kneaded foostuff;

homogenizing means in said housing along said path between said mincing unit and said downstream path end for reforming the comminuted, kneaded, and pressurized foodstuff into a homogeneous mass; and

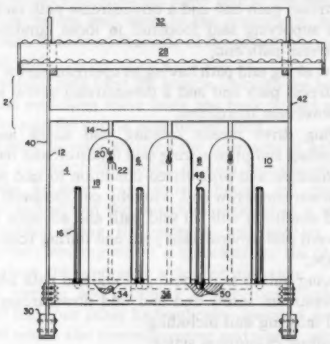
means at said downstream path including a die for reducing the homogeneous mass to crumbs, said die being formed with a plurality of holes having a combined cross-sectional area greater than said predetermined cross-sectional area of said furthest downstream set of apertures.

4,104,959
ROASTING JACK
Jean Robert Demerson, 15, Place Royale, Versailles, France (78000)
Filed Feb. 23, 1977, Ser. No. 771,813
Claims priority, application France, Feb. 27, 1976, 76 05467; Oct. 26, 1976, 76 32164
Int. Cl.[2] A47J 37/04
U.S. Cl. 99—421 H 16 Claims



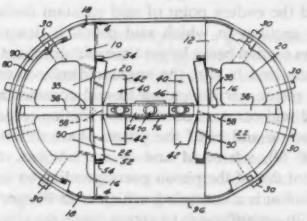
1. Turnspit moved by direct radiation from a fire, which comprises a shaft mounted in a system of bearings permitting its free rotation around its axis and, in the extension of said shaft and in an extended position in relation to said system of bearings a rotating unit, driven in rotation by said shaft, said rotating unit being made up of a first part supporting a roasting food piece, and a second metal part, located between said shaft and said first part, able to curve under the effect of the differential expansion resulting from the different temperature of the generatrix which receives the direct radiation of the fire and the generatrix opposite said fire.

4,104,960
RECYCLE PAPER COLLECTION RECEPTACLE DEVICE
W. Scott Kuhnen, P.O. Box 489, Yuba City, Calif. 95991
Filed Aug. 15, 1977, Ser. No. 824,891
Int. Cl.[2] B65B 13/06
U.S. Cl. 100—25 7 Claims



1. A recycle paper collection receptacle, comprising:
A. a longitudinally extending shelter having a base and a superposed roof structure which extends in said longitudinal direction, said shelter further including vertically extending end walls supporting said roof, said end walls extending transversely at each end of said elongated shelter; and
B. a vertically disposed center partition extending between said end walls along a longitudinal plane of symmetry for said shelter, with a plurality of vertically disposed side partitions extending transversely from either side of said center partition, thereby defining a plurality of vertically extending and outwardly open bays on either side of said center partition; wherein,
C. adjacent bays further are defined at their outward extent by removable access doors releasably mounted upon each of said transverse partitions, said doors being vertically disposed and inward of said superposed roof; wherein further,
D. each of said bays further includes an arcuate slotted channel extending inwardly from a point on said base which is exposed with said doors mounted upon said side partitions, said channel extending inwardly therefrom, to below said base through a curved transition and then vertically upward along the outwardly facing side of said center partition portion which defines each bay.

4,104,961
BRAKE SHOE LINING BONDING FIXTURE
Thomas E. Morgan, Jr., Bloomfield Hills, Mich., assignor to Leonard Friedman, Beverly Hills, Calif.
Filed Apr. 29, 1977, Ser. No. 792,150
Int. Cl.[2] B02C 11/08
U.S. Cl. 100—93 PB 4 Claims



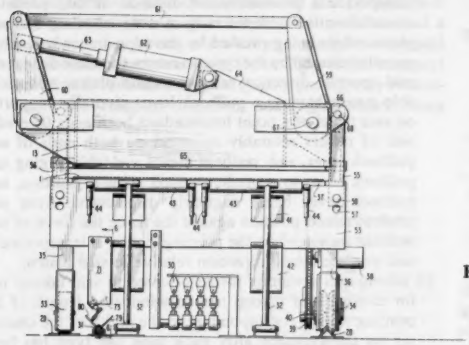
1. In a brake shoe lining fixture for bonding brake linings on to brake shoes utilizing an arcuate brake shoe support and an encircling metal band to exert pressure on the lining against the brake shoe, that improvement which comprises:
a brake shoe support arcuate in shape having an arcuate recess to receive a brake shoe, and buffer blocks at the end of said recess having a circumferentially extended curved surface circumferentially adjacent and tangential to the outer end surface of an assembled brake lining to carry the pressure band tangentially away from the curve at the end of the brake linings, said buffer block surfaces having a radial dimension slightly less than the curvature of the assembled brake linings to protect the corner ends of the brake lining against crushing.

4,104,962
PRESS
Adolfo Castillo, Miami, Fla., assignor to Automabed Building Components, Inc., Miami, Fla.
Filed Mar. 14, 1977, Ser. No. 777,090
Int. Cl.[2] B30B 1/32
U.S. Cl. 100—100 12 Claims

1. An assembly suitable for fabricating wooden panels, trusses or the like, from lumber and toothed sheet metal connector plates, said assembly comprising:
(a) a jig table means for supporting said lumber during fabrication;
(b) said jig table means including a pair of opposed jig members for holding said lumber in a predetermined position on said jig table, at least one of said jig members being horizontally retractable away from said lumber;
(c) said one jig member being clampable in position by a plurality of clamp means, said clamp means comprising fluid actuated clamp cylinder means pivotably connected at one end at a first pivot location to said jig table means, a link pivotably connected at one end at a second pivot location to the other end of said clamp cylinder means, an adjustable means pivotably connected at one end at a third pivot location to the other end of said link and adjustably fixed at the other end to said jig table, said clamp means contacting said jig member at said second pivot location,

said clamp cylinder means moving said link from a first link position in clamping contact with said jig member to a second link position retracted from clamping contact with said jig member, said link and said adjustable means cooperating to provide a rigid, incompressible clamping linkage between said jig table and said jig member when said link is in said first link position;

(d) press means to press the teeth of said connector plates into said lumber, said press means comprising a base structure including a first press platen, a head including a second press platen in opposition to said first press platen, a link means supporting said head above said base structure at least two bellcrank means mounted upon said head on



opposite sides of said press, a transfer bar means interconnecting said bellcrank means, a fluid actuated press cylinder means connecting said head and a bellcrank means, and guide means for guiding said second press platen in generally vertical movement above said first press platen, said bellcrank, said transfer bar means, said press cylinder means, and said guide means cooperating to move said second press platen means in the desired, generally vertical direction above said first press platen means while maintaining said platen means in a generally parallel relationship; and

(e) moving means to move said press means relative to lumber on said jig table means.

4,104,963

DEVICE FOR THE PRESSURE FIXING OF TONERS

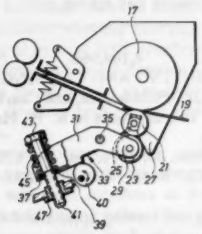
Hermann Fortmann, Wilhelmshaven, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Feb. 23, 1977, Ser. No. 771,347

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1976, 2607271

Int. Cl.[2] B30B *3/04*

U.S. Cl. 100—176 **8 Claims**



1. In a device for the pressure fixing of a toner on a record carrier under ambient temperatures; the device including a stand; a first pressure roll of relatively large diameter rotatably and stationarily supported in the stand; a second pressure roll of relatively small diameter rotatably supported in the stand and cooperating with the first pressure roll to define therewith a roll gap; means for displaceably supporting the second pressure roll to be shiftable towards and away from the roll gap; resilient force-exerting means for urging the second pressure roll against the first pressure roll; the improvement wherein said resilient force-exerting means comprises

(a) a plurality of pressure rollers arranged in a series along the length dimension of said second pressure roll; said pressure rollers being oriented axially parallel with said second pressure roll;

(b) a separate support means for individually displaceably supporting each said pressure roller for movement towards and away from said roll gap;

(c) a separate spring urging each said pressure roller into contact with said second pressure roll for exerting thereon a pressing force with which said first and second rolls compress a record carrier passing through said roll gap; and

(d) setting means for individually adjusting the pressing force exerted by each said pressure roller.

4,104,964

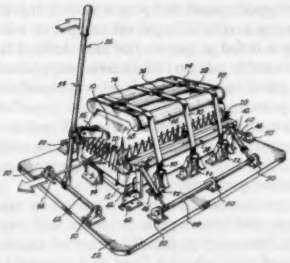
APPARATUS FOR PACKING AIRCRAFT ESCAPE DEVICES

Peter J. Larkworthy, Seattle; James A. Rose, Bothell, and Anthony J. Martin, Spokane, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 5, 1977, Ser. No. 784,831

Int. Cl.[2] B30B *7/04*; B65B *63/02*

U.S. Cl. 100—232 **15 Claims**



1. Packing apparatus for shaping and contouring a compressible item, wherein said compressible item is retained in a compressed state by compression members which encircle at least a portion of said compressible item, said compression members being configured for maintaining said compressible item in a final configuration of desired size and shape, having an upper surface, a lower surface, a first and second side surface and first and second end surfaces, each of said surfaces being of a generally predetermined contour, said packing apparatus comprising:

a base plate assembly including means for receiving and retaining a partially shaped and contoured compressible item in a fixed orientation relative to said base plate assembly, said lower surface of said compressible item contacting said base plate assembly;

first compression means engageable with said base plate assembly and positionable for compressing selected regions of said first and second end surfaces and said first and second side surfaces of said compressible item; and,

second compression means positionable on said upper surface of said compressible item, said second compression means including interconnection means for interconnecting said second compression means with said base plate assembly, said interconnection means being operable for

drawing said second compression means toward said base plate assembly to urge said upper surface of said compressible item inwardly toward said bottom surface of said compressible item.

4,104,965

CLUTCH FOR PERMITTING A DRIVEN MEMBER TO RUN AT DIFFERENT SPEED FROM A DRIVE MEMBER

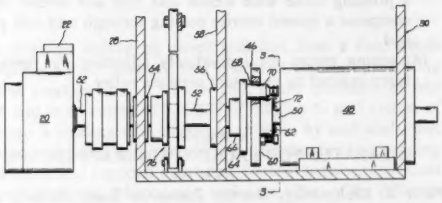
Moriaki Abe, Tokyo, Japan, assignor to E.D.M. Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1976, Ser. No. 714,662

Claims priority, application Japan, Oct. 16, 1975, 50-140986[U]

Int. Cl.[2] B44B *5/02*

U.S. Cl. 101—25 **1 Claim**



1. In hot stamping apparatus wherein heated type is pressed against a printing ribbon for imprinting characters on a continuous strip of material traveling in a predetermined direction over a platen at constant speed, the type having at least one relief character on its face, the combination of:

(a) a support panel defining a ribbon travel path including thereon a rotatable payoff reel from which the printing ribbon is fed at one end of said defined travel path:

(b) a rotatable takeup reel likewise supported by said panel at the other end of said defined travel path for accumulating the printing ribbon fed from said payoff reel, the printing ribbon traveling from said payoff reel to said takeup reel generally in a direction opposite to said predetermined direction and being placed in superposition on the strip of material over said platen;

(c) a type carrier likewise supported by said support panel along said travel path between said payoff and takeup reels, having type fixedly mounted thereon and rotatable on said panel about a fixed axis over said platen, the type on said type carrier being adapted to be pressed against the printing ribbon on the strip of material over said platen;

(d) drive means coupled to said type carrier for imparting rotation to said type carrier for revolving said type at speed synchronous with the speed of the strip of material and in a direction corresponding to said predetermined direction, comprising a source of rotary power, a drive shaft rotated by said source at predetermined speed in a predetermined direction, a drive disk fixedly mounted on said drive shaft, said drive shaft having a slot formed therein in the shape of a circular arc centered about the axis of said drive shaft, a driven shaft rotatably supported in coaxial relationship to said drive shaft and having said type carrier fixedly mounted thereon, said driven shaft being rotated by the strip of material in the same direction as said drive shaft and at speed less than the predetermined rotational speed of said drive shaft while the type on said type carrier is being pressed against the printing ribbon in superposition on the strip passing over said platen, a driven disk fixedly mounted on said driven shaft in confronting relationship to said drive disk, a pin affixed eccentrically to said driven disk and received with clearance in said slot in said drive disk for movement therealong, whereby said driven disk is rotatable relative to said drive disk through an angle limited by the length of said slot, and spring means yieldably urging said pin toward the forward end of said slot with respect to the predetermined rotational direction of said drive shaft for imparting the rotation of said drive disk to said driven disk, said pin being movable toward the rearward end of said slot against the force of said spring means for permitting said driven shaft to rotate at synchronous speed with the strip of material while the type on said type carrier is being pressed against the printing ribbon in superposition on the strip over said platen;

(e) yieldable means supported on said panel between said takeup reel and said type carrier tending to hold an extra length of the printing ribbon between said platen and said takeup reel, whereby the printing ribbon is permitted to be transported a predetermined distance in said predetermined direction with the strip of material relative to said platen while being pressed by the type and, when subsequently released by the type, to return the same distance in said opposite direction relative to said platen; said yieldable means having: a pullback lever pivotally supported on said panel at a point intermediate both ends thereof, a pair of rollers rotatably mounted on both ends of said pullback lever, and, resilient means yieldably urging said pullback lever to a predetermined angular position, said pullback lever being angularly displaceable from said predetermined position against the force the force of said resilient means when the printing ribbon is transported in said predetermined direction relative to said platen;

(f) takeup reel actuating means coupled to said takeup reel for causing said takeup reel to wind up a length of the printing ribbon corresponding to the width of the character on the typeface after each time the type has been pressed against the printing ribbon; and,

(g) drawoff means for drawing the successive desired lengths of the printing ribbon from between said platen and said type carrier coupled to said yieldable means and for feeding the printing ribbon toward said takeup reel, said drawoff means including: a pair of drawoff rollers with means urging said drawoff rollers against each other via the printing ribbon under sufficient pressure to hold the ribbon frictionally arrested therebetween when the ribbon is transported in said predetermined direction by the type, and drawoff roller actuating means including a drawoff roller shaft on one of said drawoff rollers for intermittently rotating said drawoff rollers through a predetermined angle in step with the rotation of said takeup reel, said drawoff roller actuating means also including: a cam coupled to and constantly rotated by said drive means, a cam follower mounted on said cam for translating the rotary motion of said cam into reciprocal motion, said cam follower having a free end with link means at said free end, a one-way clutch coupled to said link means, said one-way clutch being operatively connected to said drawing roller shaft transmitting the reciprocal motion of said cam follower to said one drawoff roller via said one-way clutch whereby said one drawoff roller is rotated only in such a direction that the printing ribbon is fed toward said takeup reel.

4,104,966

CAPSULE ORIENTING AND TURNING APPARATUS

Charles E. Ackley, Jr., Philadelphia, and Charles E. Ackley, Sr., Oreland, both of Pa., assignors to R. W. Hartnett Company, Philadelphia, Pa.

Filed Mar. 30, 1976, Ser. No. 672,017

Int. Cl.[2] B41F *17/36*; B65G *47/24*

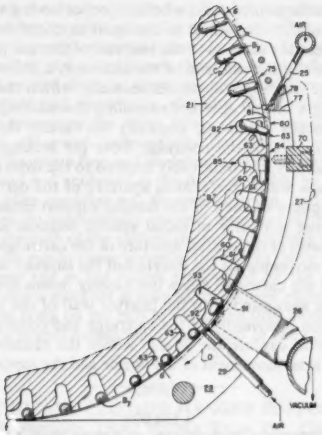
U.S. Cl. 101—40 **47 Claims**

1. In an orienting and turning apparatus for capsules having body portions and enlarged cap portions arranged along substantially a common axis, wherein a continuously movable capsule transporting means is provided having a plurality of spaced-apart pockets for the capsules, and said apparatus having a means for feeding a plurality of capsules for reception at random, caps-up and caps-down in said pockets, each said

pocket having an upright pocket portion for receiving said capsule therein with the capsule arranged in a substantially upright attitude relative to the direction of capsule movement, each said pocket also having a longitudinal pocket portion arranged to carry the capsule at an attitude with the capsule axis extending in approximately the transport direction, and each said pocket having a substantially crosswise pocket portion arranged to carry the capsule arranged in a substantially crosswise attitude relative to the direction of its movement and also substantially crosswise of said upright position,

the combination which comprises:

(a) gaging means downstream of said capsule feeding means and adjacent the path of movement of said pockets, said gaging means having spaced-apart wall members and a ceiling member having a surface extending between said wall members and extending above them in the transport direction to form an elongated gaging passageway extending in the transport direction, said gaging means being



adjusted for predetermining the width of said passageway to a value greater than the outside diameter of said capsule body portion but lesser than the outside diameter of said capsule cap portion, whereby said cap portions are frictionally engaged by said wall members to maintain said caps-up capsules in a caps-up position;

(b) tilting means for tilting the caps-down capsules toward the transport direction between the wall members of said gaging means,

said upright pocket portions having surfaces arranged to engage said cups-up capsules to overcome the frictional resistance of said wall members to force said caps-up capsules along said gaging passageway while maintaining them in a caps-up attitude, and

(c) vacuum turning means downstream of said gaging means for causing all of said cap portions that are in an upright attitude and all of said cap portions which are in an attitude extending in the transport direction to swing to an attitude in a substantially crosswise direction.

4,104,967

LINE PRINTER

Katsuhiko Okabe, Tokorozawa, Japan, assignor to Copal Company Limited, Tokyo, Japan

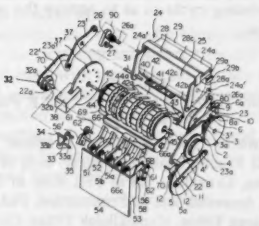
Continuation of Ser. No. 643,617, Dec. 22, 1975, abandoned.

This application Nov. 4, 1977, Ser. No. 849,112

Claims priority, application Japan, Dec. 27, 1974, 50-148651; Dec. 27, 1974, 50-148652; Dec. 27, 1974, 50-148653; Dec. 27, 1974, 50-148654; Dec. 27, 1974, 50-148655; Apr. 23, 1975, 50-48637

Int. Cl.[2] **B41J** *1/44*

U.S. Cl. 101—99 **9 Claims**



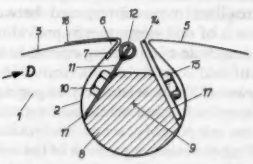
1. A line printer having a plurality of rotatable printing rings (**44**) coaxially arranged adjacent each other and carrying on at least more than one-half of each of their peripheral surfaces a plurality of characters spaced in the circumferential direction of said rings, the printer comprising means (**45**) for rotating said rings, resilient means interposed between said rotating means and each of said rings, means providing a starting position so that one cycle of a printing operation is effected by two revolutions of said rotating means from said starting position, arresting means (**51**) for selectively engaging said rings independently from each other while said rotating means is operated so as to temporarily arrest the rotation of said rings thereby shifting the relative position of the respective ring with respect to said rotating means from a predetermined relative position thereof for simultaneously holding each selected character at a printing position, a movable roller pad (**25**) abutting against said rings at a predetermined printing position with respect to said rings, thereby permitting one of said characters to be positioned by the arresting means at the printing position and be printed simultaneously on a paper held between said roller pad and said rings so as to form a printed line on the paper, means (**15**, **22** to **24**, **22'**, **23'**, **32**) for moving said roller pad toward and away from said rings to permit said roller pad to abut against said rings, means (**25,26,40,90**) for feeding the paper after each printed line, the operation of the printer being controlled so that the printed line is formed on the paper after selection of said characters has been completed, and the paper is fed after the printed line has been formed while said rings are released from their selectively arrested positions so as to restore the same to said predetermined relative position with respect to said rotating means and to terminate one printing cycle, wherein said rings are rotated by said rotating means in the same direction within each printing cycle, further comprising a stopper member (**82**) constituted as a washer for each respective ring, each stopper member having inner and outer projections, one of said projections being engaged with said rotating means so that said stopper member is rotatable with said rotating means, said resilient means comprising a coil spring having inner and outer ends, one of said ends of the coil spring being secured to a respective said printing ring, the other end of said coil spring being engaged by the other of said projections of the associated stopper member, said means for providing a starting position comprising an arresting projection on said printing ring engagable by said other end of the coil spring thereby permitting the respective ring to be held at said predetermined relative position by said arresting means while the rotating means continues to rotate and compress said coil spring whereas when said respective ring is free from said

arresting means said ring undergoes rotation together with said rotating means, said printing ring after release by said arresting means after a printing operation rotation by the action of the compressed spring until the ring returns to said starting position, and mechanical means (3', 4, 4', 5, 70) for intercoupling said rotating means, said moving means and said feeding means in a predetermined time relation between the operations of said arresting means, said moving means and said feeding means being so set that the selection of said characters and the arresting of said rings as well as the printing operation are effected within the first revolution of said rotating means, while paper feeding and releasing of said rings are effected within the last half of each printing cycle so as to restore the printer to said starting position.

4,104,968
CLAMPING DEVICE FOR FLEXIBLE PRINTING PLATES

Manfred Schwaab, Lu-Oggersheim; Helmut Puschnerat, Worms; Fritz Kluzik; Manfred Jünger, both of Frankenthal; Ernst Wilding, Grünstadt, all of Fed. Rep. of Germany, and Hans Tittes, deceased, late of Frankenthal, Fed. Rep. of Germany, by Marga Tittes, Hans-Ulrich Tittes, Gerlach Stephan Tittes, Axel Michael Tittes, heirs, assignors to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Jun. 3, 1976, Ser. No. 692,265
Int. Cl.[2] B41F *27/12*
U.S. Cl. 101—415.1 **2 Claims**



1. A device for clamping flexible printing plates onto the plate cylinder of rotary printing presses, said plate cylinder having a generally cylindrical, axially-extending groove formed in its surface whereby the groove walls extend at an acute angle into the surface of the plate cylinder defining a pair of hook-like edges at the groove opening for receiving the correspondingly hook-like bent ends of the printing plate, comprising:

a spindle pivotably disposed in said groove having an axis concentric with the groove, said spindle having a cylindrical base surface resting and riding upon the cylindrical surface of said groove;

at least one spring supported on a first side of said spindle which faces a first hook-like wall edge;

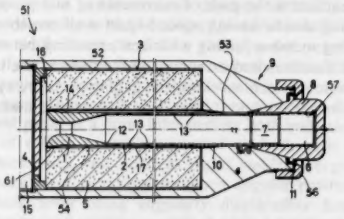
a clamping element formed at one end of said at least one spring disposed adjacent to said first hook-like edge of the plate cylinder surface for engaging the front end of the printing plate against one of said hook-like groove edges; and

a rigid bar disposed on the opposite side of the spindle axis and rigidly mounted on said spindle, said bar having an end terminating adjacent to the plate cylinder surface for receiving the hook-like bent rear end of the printing plate, said bar being directed toward the printing plate front end, so that when the spindle is pivoted on its axis, the extending end of said bar will engage said clamping element, and, in turn, urge the clamping element against the first hook-like edge of said groove, so that said front end and said rear end of said printing plate may be securely clamped between said first hook-like edge of said groove and said clamping element, and between said clamping element and said bar, respectively.

4,104,969
ARRANGEMENT FOR IMPROVING THE BURNING EFFICIENCY OF A ROCKET-BORNE SOLID PROPELLANT CHARGE CARTRIDGE

Manfred Moll, Dusseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 10, 1977, Ser. No. 767,379
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605768
Int. Cl.[2] F02K *9/04*
U.S. Cl. 102—49.3 **8 Claims**

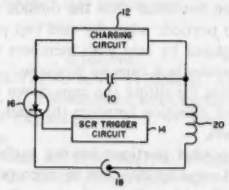


1. In a ballistic projectile, a hollow jacket having a rear wall portion radially bounding a combustion chamber, locking means releasably secured to the rear end of the rear jacket wall portion for closing one end of the chamber, a hollow propellant charge cartridge supported coaxially within the chamber and having a central aperture extending therethrough, tubular support means extending coaxially forwardly through the central aperture of the cartridge from the locking means, a nozzle coaxially and removably secured to the front end of the support tube within the central aperture of the cartridge, the outer periphery of each of the tubular support means and the nozzle being normally in radial spaced relation to the surrounding wall of the central aperture of the cartridge to permit rearward movement of the nozzle and the support means with respect to the cartridge when the locking means are released, and means associated with the interior wall of the jacket rear wall portion rearwardly of the cartridge and cooperable with the nozzle to capture the nozzle within the chamber upon a rearward axial movement of the nozzle and the support means.

4,104,970
ELECTRONIC IGNITION SYSTEM FOR LIQUID EXPLOSIVE

Gary L. Petersen, and Larry L. Liedtke, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 10, 1977, Ser. No. 767,602
Int. Cl.[2] F42C *11/00*
U.S. Cl. 102—220 **10 Claims**



1. In an electrical ignition system for firing liquid explosives the improvement which comprises:

an electro-optical isolated trigger circuit;

a silicon controlled rectifier, SCR, activated by said trigger circuit:

a capacitor electrically connected to discharge through said SCR when it is activated;

a charging circuit electically connected to said capacitor for charging said capacitor;

an inductor electrically connected to said SCR for limiting the peak current when said trigger circuit is activated; and

an ignitor electrically connected between said trigger circuit and said inductor.

4,104,971
CAR WASH CONVEYOR BELT SAFETY PROTECTION SYSTEM

Gilbert Savard, St. Leonard, Canada, assignor to BP Canada, Canada

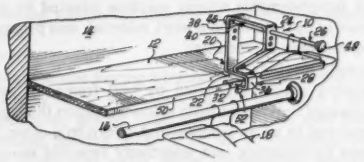
Filed Dec. 20, 1976, Ser. No. 752,959
Claims priority, application Canada, May 4, 1976, 251780
Int. Cl.[2] B61B *13/00*; B65G *35/00*
U.S. Cl. 104—172 B **1 Claim**

1. In a car wash conveyor system, for use in a car wash enclosure, and including an elongated conveyor pit extending the length of the car wash enclosure; an idler sprocket pit at one end of the conveyor pit and having an idler sprocket therein; a drive sprocket pit at the second end of the conveyor pit and having a drive sprocket therein; means for rotating the drive sprocket; and a continuous chain drive extending around the sprockets and along an upper run and a lower run between the sprockets and carrying a plurality of elongated rollers extending transverse the chain drive; the improvement comprising an elongated, substantially flat-surfaced continuous safety belt having a first end anchored at the idler sprocket pit and a second end anchored at the drive sprocket pit and overlying the idler sprocket pit, the conveyor pit, and the drive sprocket pit to substantially prevent insertion of foreign objects into the path of the rollers, the belt contacting the rollers on the upper run to cause waves in the belt to move the length of the upper run as the rollers are carried by the upper run while the drive sprocket is rotated, the waves engaging automobile tires lying on the belt to rotate the tires along the belt, and thus to propel automobiles the length of the upper run.

4,104,972
AUXILIARY CLOTHES HANGER SUPPORT

Harvey W. Baublitz, 15042 Rolling Ridge Dr., Chino, Calif. 91710

Filed Sep. 27, 1976, Ser. No. 726,929
Int. Cl.[2] A47B *97/00*
U.S. Cl. 108—31 **6 Claims**



1. An auxiliary clothes hanger support for attachment to a shelf having an exposed edge comprising:

a mounting bracket having a base surface and a normally upright front side,

said bracket comprising a folded metal strap having a flat end portion and an adjacent flat strap portion disposed in spaced parallel relation and joined by a connecting strap portion to form a normally lower yoke shaped base for straddling said shelf edge, said base having said base surface, and a remaining strap portion extending upwardly from said adjacent strap portion, then lengthwise of said adjacent strap portion, and then back to said adjacent strap portion to form an upper generally loop shaped bracket portion above and projecting forwardly of said base and having said front bracket side and an opposite rear bracket side with aligned holes for slidably receiving a hanger support rod,

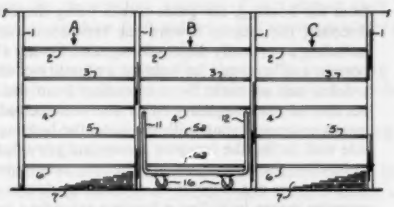
said hanger support rod slidable endwise in said base in the fore and aft direction of the base with the rod axis parallel to said base surface for extension of said rod in the forward direction to an extended hanger supporting position wherein the front end of said rod projects beyond said front bracket side and for rearward retraction of said rod to a position wherein the front end of said rod is adjacent said front bracket side,

means comprising said base and a clamp screw threaded in said base for mounting said bracket on said shelf adjacent said shelf edge with said bracket surface seating on the shelf and said front bracket side adjacent and facing in the same direction as said shelf edge, whereby in said extended position of said hanger support rod, said front rod end projects beyond said shelf edge to support clothes beyond said front shelf edge.

4,104,973
METHOD AND APPARATUS FOR DISPLAYING BREAD IN SUPERMARKETS

John R. Dwyer, 3660 Culpepper Dr., Erie, Pa. 16506

Filed Aug. 13, 1975, Ser. No. 604,356
Int. Cl.[2] A47B *57/00*
U.S. Cl. 108—59 **6 Claims**



1. A display for bakery products having vertical uprights with horizontal shelves between the upper portions of the uprights open to the front of the display, a pocket between the uprights below the shelves and likewise open to the front of the display, a truck removably received in said pocket, said truck having end frames adjacent the uprights and at least one horizontal shelf extending lengthwise between the end frames and depthwise into said pocket so one horizontal edge of the shelf is at the front of the display and the other horizontal edge of the shelf is at the back of the display, said shelf being adapted for supporting a row of loaves of bread along each horizontal edge with the individual loaves side by side so that when the row at the front of the display is sold the other row may be brought to the front by moving the truck out of the pocket, turning the truck end for end and reinserting the truck in the pocket.

4,104,974
TRANQUILIZER EJECTOR FOR DISABLING ROBBERS

Max L. Robinett, U.S. Hwy. 41 North, Hanson, Ky. 42413

Filed May 19, 1977, Ser. No. 798,468
Int. Cl.[2] E05G *5/00*
U.S. Cl. 109—2 **4 Claims**

1. A system for disabling robbers, comprising, in combination:

(a) ejector means arranged extending longitudinally along a long, narrow passageway for projecting discrete articles across the passageway in a continuous line along the

length of the passageway, with at least some of the articles striking a fleeing robber; and

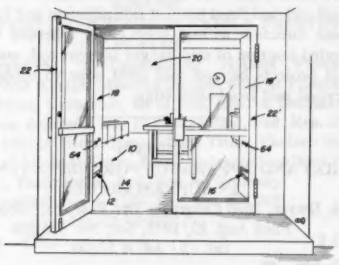
(b) receptor means disposed opposite the ejector means and spaced from the ejector means across the passageway for receiving articles projected from the ejector means, the ejector means including, in combination:

(1) a housing extending longitudinally along substantially a length of the passageway;

(2) actuator means for actuating the ejector means;

(3) a plurality of guide means disposed side-by-side in the housing along the longitudinal extent thereof for directing discrete articles from the housing, the discrete articles including a tranquilizer and having a pointed shape; and

(4) compressed fluid means connected to the guide means for propelling the discrete article in the guide means



from the housing, the guide means being disposed for directing the articles toward the receptor means and including a vertically disposed magazine having a lower portion and arranged for holding a plurality of discrete articles, and an outlet bore extending from the lower portion of the magazine, with the compressed fluid means communicating with the bore, the housing has a side wall facing the receptor means and provided with a plurality of apertures, each of the apertures registering with the bore of a respective one of the guide means, the receptor means including a housing extending longitudinally coextensive with the housing of the ejector means, the housing of the receptor means having an open side facing the ejector means, with a penetrable material being disposed in the housing of the receptor means and arranged for retaining the discrete articles.

4,104,975

TRANSPLANTING APPARATUS

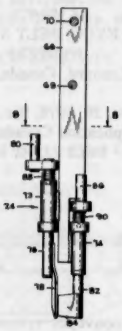
Lawrence L. Ingram, and Javier D. Infante, both of Salinas, Calif., assignors to Bud Antle, Inc., Salinas, Calif.

Filed Jan. 10, 1977, Ser. No. 757,995

Int. Cl.[2] A01C *11/02, 9/06*

U.S. Cl. 111—3 **4 Claims**

1. Apparatus for transplanting into a trench a plant having an elongate body of root supporting media from which a plant stalk extends comprising a circular wheel, means for supporting said wheel for rotation about a horizontal axis above the trench, at least one rigid bar secured to said wheel and extending radially from the periphery thereof, first and second radially extending shafts mounted on said rigid bar, for pivotal movement about respective axes that are spaced apart from one another by an amount corresponding to the transverse dimension of said body of root supporting media, each said shaft having a distal end outward of said rigid bar and a proximal end remote from said distal end, a first gripping plate fixed to the distal end of said first shaft and a second gripping plate fixed to the distal end of said second shaft, said second gripping plate being of generally L-shaped configuration and having a portion remote from said second shaft that extends toward said first plate for spacing said plates in approximate parallel relation to grip said body of root supporting media, means remote from said plates for resiliently biasing said shafts so that said gripping plates reside in a gripping position at which said plates are substantially parallel to one another and extend approximately perpendicularly to the plane of said circular wheel, means remote from the trench for introducing a plant between



said plates with the stalk extending radially inward toward said axis, and means for pivoting said shafts against said biasing means away from one another and into approximate parallelism with the plane of said circular wheel so as to reside laterally of said body, said pivoting means acting when said body resides upright in said trench.

4,104,976

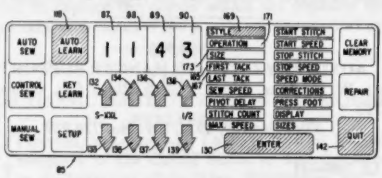
PROGRAMMABLE SEWING MACHINE

John Vernon Landau, Jr.; Barney Dean Hunts, both of Mountain Lakes; Frederick Alexander Rupinski, Lyndhurst, and Alfred John Zenger, Montville, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,888

Int. Cl.[2] D05B *19/00*

U.S. Cl. 112—121.11 **13 Claims**



1. A programmable sewing machine adapted to perform a sequence of operations on a work material, said programmable sewing machine comprising:

a sewing machine frame;

a sewing needle supported by said frame for selectively repeated movement from a down position through a work material to an up position and return to a down position;

means for counting said selectively repeated movement of said sewing needle;

a looptaker supported by said frame for cooperation with said sewing needle in the formation of stitches;

a reversible work material feed system supported by said frame and including feeding means for passing work material in a path between said needle and said looptaker;

drive means for actuating said sewing needle, said looptaker and said work material feed system in synchronism with each other;

manual regulating means for selectively actuating said drive means;

a presser device selectively movable from a position urging

said work material against said feeding means to a position out of contact with said work material;

manual control means for selectively moving said presser device out of contact with said work material;

means for measuring time duration of actuation of said manual control means;

a computer having means for self directed recording once initiated of a sequence of operations of the manual actuation of said regulating means including the count from said counting means of the selectively repeated movement of said sewing needle, and of the manual actuation of said control means for selectively moving said presser device including the time duration of actuation thereof from said time duration measuring means; and,

means for enabling said sewing machine to be operated in accordance with instructions from said recording means of said computer.

4,104,977

FABRIC-FEED CONTROL FOR SEWING MACHINE

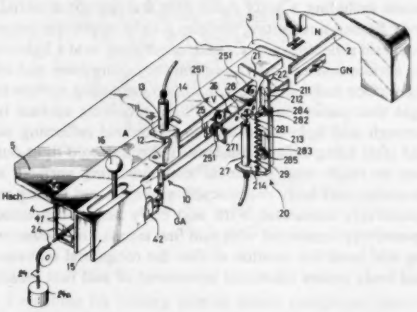
Konrad Pollmeier, Bielefeld, and Franz Hannemann, Detmold, both of Fed. Rep. of Germany, assignors to Dürkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Filed May 3, 1977, Ser. No. 793,419

Claims priority, application Fed. Rep. of Germany, May 8, 1976, 7614577

Int. Cl.² D05B *21/00*

U.S. Cl. 112—121.26 **15 Claims**



1. A sewing station for seaming of material, comprising in combination:

a table;

a sewing machine having a transporting feed mechanism for advancing fabric to be sewn on said table past a needle;

an edge guide spaced from said needle on said table for automatic guiding of the fabric for advancement with its edge along said guide while the seaming operation is carried out;

separating plates ahead of said edge guide for separating layers of the fabric;

a movable clamp actuatable to grip the fabric for advancing with the fabric to be seamed, said movable clamp being guided linearly on said table toward and away from said needles;

a fixed clamp on said table remote from said needle for preparatory positioning and holding of the fabric; and

control means for alternately actuating said fixed clamp and said movable clamp to respectively grip and release the fabric.

4,104,978

PROTECTIVE DEVICE IN A MOTOR-OPERATED SEWING MACHINE

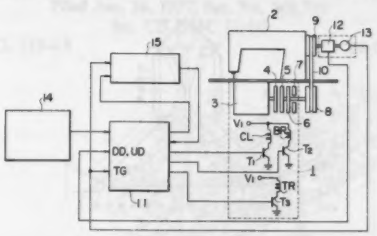
Tadashi Takahashi; Shigeki Morinaga, and Kuniaki Kubokura, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 13, 1977, Ser. No. 806,154

Claims priority, application Japan, Jun. 12, 1976, 51-68227

Int. Cl.² D05B *69/36*

U.S. Cl. 112—277 **10 Claims**



1. A protective device in a motor-operated sewing machine, comprising:

a motor, means for transmitting rotation of said motor to an output shaft through a clutch mechanism provided on a shaft of said motor, said clutch mechanism being actuated electromagnetically, and means for stopping said output shaft through a brake mechanism being actuated electromagnetically,

means for transmitting rotation of said output shaft to a sewing machine shaft and drive said sewing machine shaft at a predetermined speed,

electrical control means for electrically controlling said clutch mechanism and said brake mechanism in order to control rotation of said sewing machine shaft,

means for detecting substantial rotation of said sewing machine shaft, and

protector means for rendering the operation of said clutch mechanism ineffective through said control means when an output of the rotation detecting means has become lower than a reference value for driving the sewing machine shaft at said predetermined speed.

4,104,979

HOPPER BARGE HAVING A BOTTOM DISCHARGE OPENING CLOSED BY HOPPER DOORS

Bartele van der Werff, Medemblik, Netherlands, assignor to A. Vuyk & Zonen's Scheepswerven B.V., Capelle aan den Ijssel, Netherlands

Filed Oct. 29, 1976, Ser. No. 736,932

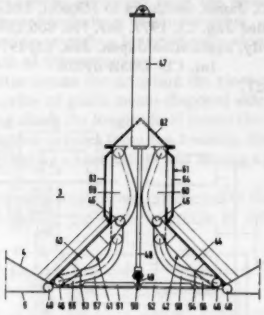
Claims priority, application Netherlands, Nov. 4, 1975, 7512915

Int. Cl.² B67D *3/00*

U.S. Cl. 114—36 **7 Claims**

1. A hopper barge comprising a hopper including opposed inclined converging bottom walls and vertical walls extending downwardly from said bottom walls to define an outlet, a center keelson box positioned above said outlet at a level above the bottom walls, a pair of pivotable doors for closing said outlet, and control means coupled to said doors to pivotably and translationally move the same from a first position in which the doors close said outlet to a second position in which the doors are suspended vertically and are substantially withdrawn into the keelson box to open said outlet, said doors in said first position extending obliquely and having respective free ends in sealed relation with said walls of the hopper, said control means including means engaging said doors at an intermediate location along the length thereof for moving the doors

pivotably and translationally between said first position in which the doors are oblique and are outside the keelson box



and said second position in which said doors are suspended vertically within the keelson box.

4,104,980

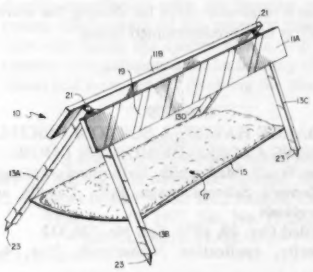
COLLAPSIBLE ROAD BARRIER

John Toomey, Alexandria, Va., assignor to Value Engineering Company, Alexandria, Va.

Filed Jun. 17, 1977, Ser. No. 807,547

Int. Cl.[2] E01F *13/00*

U.S. Cl. 116—63 P **11 Claims**



1. A collapsible road barrier comprising:

at least one substantially horizontal member;

four supporting legs positioned in pairs, each pair being pivotally affixed at an upper end thereof;

said pairs of supporting legs being spaced from each other and affixed at an upper end thereof to said substantially horizontal member;

a collapsible bunk positioned adjacent the lower end of the supporting legs which forms a substantial surface area upon which material such as ballast may be positioned; and

said collapsible bunk being flexible so as to readily fold when said collapsible road barrier is stored and to readily return to said substantial surface area when said collapsible road barrier is positioned for use.

4,104,981

INDICATOR USING CHANGEABLE PATH THROUGH TRANSPARENT MATERIAL

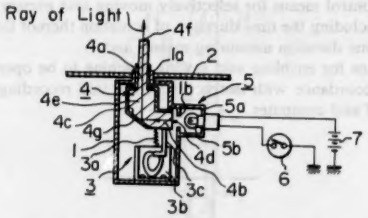
Katsutoshi Ono, Ichikawa, and Koichi Sekiguchi, Shakujii, both of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Aug. 30, 1976, Ser. No. 718,970

Claims priority, application Japan, Sep. 10, 1975, 50/124438[U]

Int. Cl.[2] H01H *9/16*

U.S. Cl. 116—124 L **5 Claims**



1. An indicator comprising: first means for emitting a ray of light; and second means having an indicating surface for receiving the ray of light to permit the ray of light to illuminate said indicating surface, said first and second means being movable relative to each other to change their relative position to vary intensity of illumination of said indicating surface, said first and second means being movable relative to each other between a first position in which the ray of light illuminates said indicating surface and a second position in which the ray of light is prevented from illuminating said indicating surface, means mounting said first means for rotation, said second means including a body made of a transparent material, said body having a reflecting surface, a light-in portion projecting from said reflecting surface and terminating in at a light-receiving surface and a light-out portion projecting from said reflecting surface and terminating in at said indicating surface so that light that passes through said light-receiving surface travels through said light-in portion to strike said reflecting surface and after being reflected it travels through said light-out portion to reach and illuminate said indicating surface, means mounting said body reciprocally movable, and having an arm operatively connected with said body and an opposite arm operatively connected with said first means, and means mounting said lever for rotation so that the reciprocal movement of said body causes rotational movement of said first means.

4,104,982

TRANSMISSION GEAR RATIO INDICATOR

Norbert R. Hegemann, Burlington, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

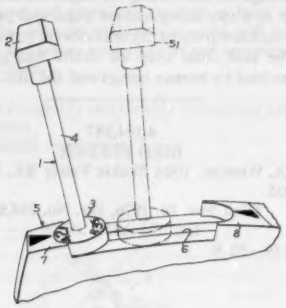
Filed Oct. 11, 1977, Ser. No. 841,050

Int. Cl.[2] F16H *5/76*

U.S. Cl. 116—124 M **10 Claims**

1. A rotatable and pivotal shift lever and indicator for a vehicle transmission comprising, a shift lever including a handle for controlling the movement of the shift lever, means rotatably supporting said lever for rotation on a longitudinal axis, means pivotally supporting said lever for pivotal movement of said lever on a transverse axis, a control console having a gate plate defining the pivotal movement of said shift lever, a shift mechanism connected to said shift lever for shifting a vehicle transmission between gear ratios responsive to

rotating and pivoting of said shift lever, an indicator on said shift lever and control console correlated with the gear ratio



positions of the transmission for indicating to the operator the selected transmission gear ratio and shift lever position.

4,104,983

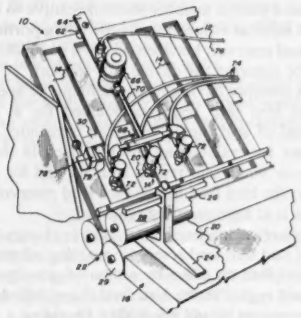
PULSATING GLUE HEAD FOR FOLDING MACHINES

Howard B. Carstedt, Rte. 1, Box 208, Loretto, Minn. 55357

Filed Aug. 18, 1976, Ser. No. 715,443

Int. Cl.[2] B05C *5/02*

U.S. Cl. 118—2 **5 Claims**



1. In a machine for folding printed sheets comprising sheet feeding means, at least one pair of fold rollers, and travel stop means located downstream of said pair of fold rollers in the direction of sheet movement for stopping moving sheets and initiating buckling and folding of printed sheets, the improvement comprising:

a spot glue dispenser located in the space between said pair of fold rollers and said stop means adjacent to said fold rollers, said dispenser comprising cylinder means secured to said folding machine at a vertically offset location from the path of movement of printed sheets, a piston within said cylinder means reciprocally displaceable from a rest position to an extended, glue dispensing position, and a glue output orifice on said piston normally spaced from moving sheets and movably positioned to contact a sheet and spot glue same when said piston is in said extended position; and

sensing means positioned immediately adjacent to said stop means on the upstream side thereof with respect to the direction of sheet movement, in position to be actuated by movement of the leading edge of a moving sheet, said sensing means being operable to initiate movement of said piston to said glue dispensing position, whereby said dispenser is actuated to apply a spot of glue to a sheet at the moment a sheet is stopped against said stop means.

4,104,984

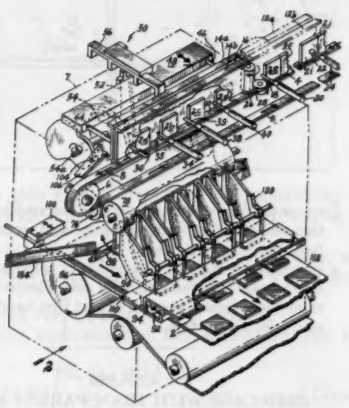
ARTICLE HANDLING AND COATING APPARATUS

Arnold LeRoy Kellermann, Goshen; David Ian McDonald, Cincinnati, both of Ohio, and Robert Joseph Grone, Covington, Ky., assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jun. 24, 1977, Ser. No. 809,799

Int. Cl.[2] B05C *13/00*

U.S. Cl. 118—2 **16 Claims**



1. An apparatus for precision placement of workpieces onto a transport member, comprising:

(a) a base;

(b) an infeed conveyor movable in a predetermined direction;

(c) means upon said base for aligning a plurality of workpieces in a fixed spacial relationship upon said infeed conveyor;

(d) means for effectuating relative movement between the spacially aligned workpieces and infeed conveyor transverse to the direction of the infeed conveyor movement to abandon subjacent support and permit free falling gravity biased workpiece movement;

(e) a planar surface supported upon said base, said surface being substantially horizontally disposed;

(f) means for interrupting the free falling gravity biased movement and directing workpieces onto said planer surface; and

(g) means for removing the workpieces from said planar surface for deposit upon a transport member.

4,104,985

APPARATUS FOR APPLYING MATERIAL TO A SUBSTRATE

Gerhart P. Klein, Manchester, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Division of Ser. No. 527,682, Nov. 27, 1974, abandoned. This application May 7, 1976, Ser. No. 684,130

Int. Cl.[2] B05C *1/02*

U.S. Cl. 118—211 **4 Claims**

1. An apparatus for applying material to a selected portion of articles comprising:

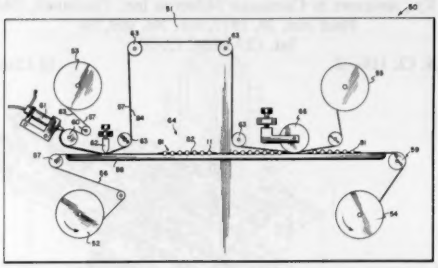
a. a first belt and first cooperating rollers providing movement to same.

b. means disposed adjacent said first belt applying a first band of material to same,

c. a second belt and second cooperating rollers providing movement to same over a loading bar,

d. means disposed above said loading bar bringing said first belt into engagement with said second belt after said first band of material has been applied so as to transfer a portion of same to said second belt and provide a second band of material thereon,

e. at least one of said first cooperating rollers disposed to separate said first belt from said second belt after said material has been transferred,



f. means holding said articles on said second belt in a position that said selected portions engage said second band after it has been provided, and

g. means returning said first belt back into engagement with said second belt and also with said selected portions so as to apply at least a portion of said first band of material to said selected portion.

4,104,986

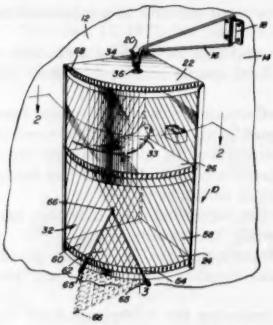
BIRD CAGE WITH TRANSPARENT SHIELD

Opal Dunigan, 2204 W. Hillmont, Odessa, Tex. 79762

Filed Jun. 24, 1976, Ser. No. 699,229

Int. Cl.[2] A01K *31/06*

U.S. Cl. 119—17 **5 Claims**



1. A bird cage comprising a generally vertically disposed triangular configured enclosure adapted to be positioned in the corner of a room, or the like, said enclosure including a pair of vertically disposed planar side walls oriented in angular relation to each other with the intersection therebetween defining a rear corner of the enclosure, and a front wall of arcuate configuration interconnecting and extending between the outer end of the side walls, a generally triangular top imperforate member and triangular imperforate bottom member forming top and bottom closures for the area encompassed by the side walls and front wall, said enclosure including access means therein to enable ingress and egress of a bird and to enable feeding of the bird, bathing of the bird and cleaning the cage, each side wall being constructed from a plurality of generally parallel, equally spaced rods, said front wall being constructed with a spaced rod bottom portion and an imperforate transparent panel forming the top portion of the front wall, an imperforate partiton of generally triangular configuration centrally located between the top and bottom of the cage and generally aligned with the bottom edge of the imperforate transparent panel, and means removably supporting said partition in the cage for converting the cage from a single compartment cage to a two compartment cage, and providing a support for a bird inwardly of the imperforate transparent panel to protect the bird from cold air drafts and germs breathed toward the bird by human beings and the like.

4,104,987

BIRD FEEDER

Emanuel A. Winston, 190A Skokie Valley Rd., Highland Park, Ill. 60035

Filed Nov. 26, 1976, Ser. No. 744,992

Int. Cl.[2] A01K *39/00*

U.S. Cl. 119—51 R **14 Claims**

1. A bird feeding device for distributing bird feed, comprising in combination:

a first and a second member secured relative to one another;

said first member comprising a protruding portion forming a bird feed reservoir between said first and second members;

means for securing the device to a support;

said first member having means defining an aperture region in said bird feed reservoir adapted for at least partial removal of said means from the remainder of said first member for maintaining the bird feed in said bird feed reservoir when said region is intact and for enabling access to the bird feed in said bird feed reservoir when said region is at least partially removed;

said aperture region being located in proximity to the lower end of said bird feed reservoir enabling substantially all of the bird feed to move by action of gravity toward said aperture region as the bird feed is consumed;

perch receiving means removably receiving a perch to extend outwardly from said first member and in proximity to said aperture region enabling a bird to rest on the perch and to consume bird feed from said aperture region.

4,104,988

ARTICULATED ENCLOSURE

John Trutor, Benson, Vt.

Filed Jul. 29, 1976, Ser. No. 709,664

Int. Cl.[2] A01K *39/00*

U.S. Cl. 119—51 R **1 Claim**

1. An enclosure providing a feeder for birds having four walls disposed generally at right angles to each other and constructed of long flitches arranged as a cribwork with interstices between said long flitches,

short flitches disposed in said interstices filling said interstices,

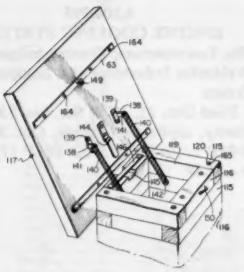
the ends of said long flitches in two said walls opposite each other crossing the ends of the said long flitches forming two other said walls,

said ends of said long flitches at each corner having a hole extending therethrough,

long rods,

said long rods extending through the said holes at each said corner,

means on each said long rod securing said long flitches together at said corners,
a floor underlying said walls,
at least two short rods,
each said short rod extending through at least one of said long flitches adjacent said floor in a said wall and through said floor and means on said short rod securing said floor to said enclosure,
a cover,
hinge means swingably and slidably connecting said cover to said cribwork,
said hinge means comprising,



strap means,
said strap means being swingably connected to said cover and swingably and slidably connected to two of the walls of said enclosure,
a bracket fixed to the underside of said cover,
the rear end of said bracket means being offset and spaced downwardly from said cover,
a notch in one of said enclosure walls,
said notch being adapted to receive said offset end of said bracket for holding said cover in closed position,
an opening means in said walls in said enclosure providing access to feed in said feeder by birds.

4,104,989

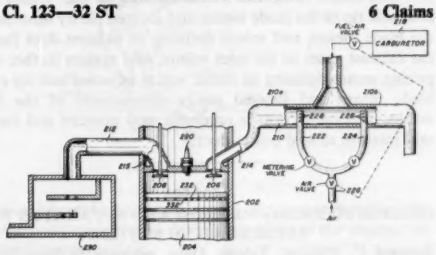
STRATIFIED CHARGE

Edwin L. Resler, Jr., Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 472,361, May 22, 1974, abandoned. This application Sep. 4, 1975, Ser. No. 610,420

Int. Cl.[2] F02B *19/10, 19/16*

U.S. Cl. 123—32 ST **6 Claims**



1. In an internal combustion engine having at least one cylinder with a power member and intake and outlet valves; a source of fuel-air mixture; means including a fuel-air throttle valve and an intake manifold for supplying said fuel-air mixture to said cylinder via said intake valve; and an exhaust manifold for removing exhaust gases from said cylinder via said exhaust valve;

The improvement which comprises pre-stratifying charge means including a source of air at pressure greater than the pressure in said intake manifold connected to said intake manifold through a flow control orifice having a cross sectional area of such dimensions that the quantity of air entering said intake manifold between said intake valve and said fuel-air throttle valve causes an increase of manifold pressure by about 30% and the quantity of air entering said manifold through said orifice is sufficient to fill an appropriate volume of the manifold between said intake valve and said fuel-air throttle valve thereby creating a pocket of fuel lean air/fuel mixture between said intake valve and said fuel-air throttle valve.

4,104,990

PROCESS AND APPARATUS FOR DETERMINING ENGINE OPERATION NEAR THE LEAN-RUNNING LIMIT

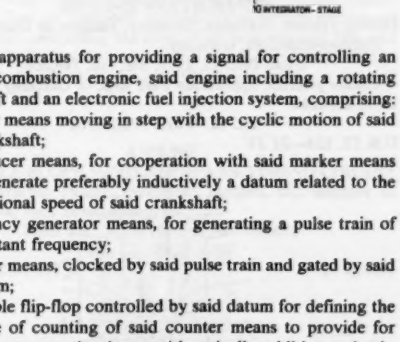
Wolf-Dietrich Frobenius, Asperg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 19, 1976, Ser. No. 659,539

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1975, 2507139

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EA **7 Claims**

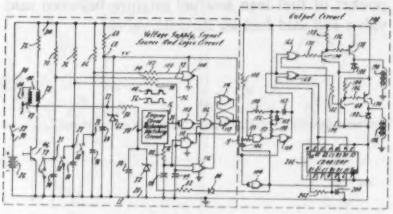


1. An apparatus for providing a signal for controlling an internal combustion engine, said engine including a rotating crankshaft and an electronic fuel injection system, comprising:
marker means moving in step with the cyclic motion of said crankshaft;
transducer means, for cooperation with said marker means to generate preferably inductively a datum related to the rotational speed of said crankshaft;
frequency generator means, for generating a pulse train of constant frequency;
counter means, clocked by said pulse train and gated by said datum;
a bistable flip-flop controlled by said datum for defining the sense of counting of said counter means to provide for alternate counting in an arithmetically additive and subtractive sense;
an AND gate one of whose inputs receives said datum and the other of whose inputs is connected to receive said pulse train from said frequency generator means, the output of said AND gate being connected to the clock input of said counter means; and
means connected to the counter means for providing an output control signal from the output of the counter means.

4,104,991
CIRCUIT FOR CONTROLLING THE OPERABILITY OF ONE OR MORE CYLINDERS OF A MULTICYLINDER INTERNAL COMBUSTION ENGINE

Richard V. Abdoo, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 23, 1976, Ser. No. 716,865
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EA **5 Claims**



1. In a system for controlling the operability of one or more cylinders of a multicylinder internal combustion engine, said system including:

(a) electrically controllable means for disabling at least one cylinder of said internal combustion engine;

(b) circuit means for sensing a plurality of conditions of operation of said engine;

(c) logic circuit means, responsive to said sensing circuit means, for generating electrical signals for controlling the energization and de-energization of said disabling means; and

(d) output circuit means, coupled between said logic circuit means and said disabling means, for controlling electrical energy supplied to said disabling means in response to said electrical signals generated by said logic circuit means;

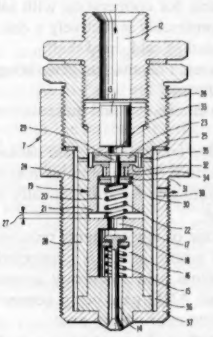
the improvement which comprises:

(e) means for preventing oscillatory energization and de-energization of said disabling means which may otherwise occur from transient conditions of engine operation that result from a change of said disabling means from an energized state to a de-energized state or vice versa.

4,104,992
INJECTION INSTALLATION FOR INTERNAL COMBUSTION ENGINES

Ludwig Fricker, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 13, 1976, Ser. No. 749,806
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556214
Int. Cl.² F02B *3/00, 3/04*
U.S. Cl. 123—32 JV **21 Claims**

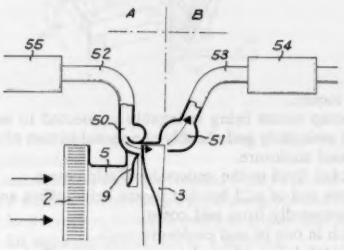


1. An injection installation for internal combustion engines, comprising injection pump means and injection valve means coordinated to the cylinders of the internal combustion engine, characterized in that a metering means is arranged in each injection valve means which is operable with a feed of the injection pump means, to feed a metered quantity of fuel to the nozzle discharge of the injection valve means, the injection pump means being so constructed that it always feeds a multiple of the metered quantity of fuel independently of load and rotational speed of the internal combustion engine, the excess quantity of fuel, thus fed from the injection pump means, being discharged back to a fuel tank adapted to be connected to the injection valve means by way of a return line.

4,104,993
ENGINE COOLING SYSTEMS

Yves Baguelin, Louveciennes, France, assignor to Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques Saviem, France

Filed Oct. 21, 1976, Ser. No. 734,379
Claims priority, application France, Oct. 30, 1975, 75 33214
Int. Cl.² F01P *7/10;* **F01N** *3/02;* **F01P** *11/10;* **F28F** *9/22*
U.S. Cl. 123—41.49 **1 Claim**



1. In an engine cooling system, a radiator, fan means inducing an air flow through the radiator, connecting tube means located between the radiator and the fan means, means forming said air flow into a main central stream and an auxiliary peripheral stream, means feeding a gas to be cooled directly into said auxiliary stream to be mixed therewith to form a gas mixture, means defining an outlet duct for said mixture wherein the gas to be cooled is formed by the exhaust gases of the engine and said fan means comprises blade means having an outer tip, and said feed means comprises means defining an inlet volute adjacent said tip of the blade means and located partly upstream of the blade means, and means defining an exhaust duct feeding the exhaust gases to the inlet volute, said system further comprising means defining an outlet volute adjacent said tip of the blade means and located partly downstream of the blade means, said outlet volute receiving said mixture and feeding said mixture to said outlet duct.

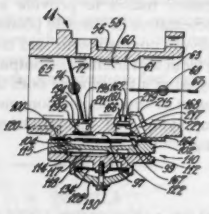
4,104,994
CHARGE FORMING METHOD AND APPARATUS WITH ACCELERATING SYSTEM

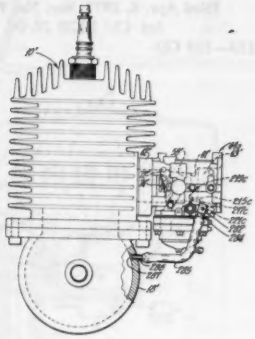
Bernard C. Phillips, Toledo, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 1, 1976, Ser. No. 719,456
Int. Cl.² F02B *33/04;* **F02M** *37/00*
U.S. Cl. 123—73 R **21 Claims**

1. A method of effecting delivery of fuel through an aperture from a fuel chamber into an air and fuel mixing passage of a charge forming apparatus having a throttle valve in the mixing passage including regulating flow of liquid fuel from a supply into the fuel chamber, delivering fuel by aspiration in the mixing passage from the fuel chamber through the aperture into the air and fuel mixing passage when the air flow in the mixing passage is of sufficient velocity to aspirate fuel from the

aperture, and projecting gases from a nozzle across the aperture to effect aspiration of additional fuel from the aperture





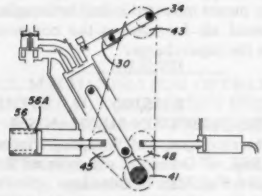
into the mixing passage when the air flow in the mixing passage is at a low velocity.

4,104,995

VARIABLE COMPRESSION ENGINE

Rolf Steinbock, 603 Lindsay Rd., Carnegie, Pa. 15106

Filed Dec. 15, 1976, Ser. No. 750,904
Int. Cl.² F02B 75/04
U.S. Cl. 123—78 D **14 Claims**



1. In an internal combustion engine, an apparatus to vary the effective compression ratio during operation of the engine, the combination comprising:

casting means defining two cylinders communicating with a common combustion chamber,

a first piston reciprocating in one of said cylinders to convert released thermal energy into mechanical energy,

a first crankshaft coupled for displacing said first piston to operate at a first fixed compression ratio in said common combustion chamber,

a second piston reciprocating in the other of said cylinders,

a second crankshaft coupled for displacing said second piston to operate at a second fixed compression ratio in said combustion chamber,

timing means to change the relative rotational phase relation between said first and second crankshafts for varying a net compression ratio formed as a composite of said first and second fixed compression ratios at which gases are compressed in said combustion chamber by both of said first and second pistons,

supercharged means to increase the pressure at which gases are introduced into at least one of said two cylinders for compression in said combustion chamber, and

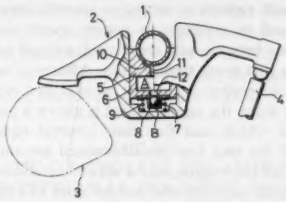
control means coupled to said timing means for adjusting the compression ratio of the two crankshaft piston systems automatically in relation to the supercharged pressure.

4,104,996

GAP SELF-COMPENSATING HYDRAULIC ROCKER ARM

Akira Hosono, Toyota; Yoshihisa Isogai, Okazaki; Hitoshi Hasegawa, Nagoya, and Toshio Tanahashi, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 14, 1976, Ser. No. 732,323
Claims priority, application Japan, Aug. 10, 1976, 51-94526
Int. Cl.² F01L 1/18, 1/24
U.S. Cl. 123—90.43 **7 Claims**



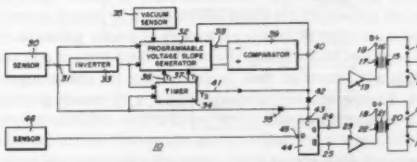
1. A gap self-compensating hydraulic rocker arm assembly for an internal combustion engine having a rocker shaft, at least one hollow rocker arm having oil passage means through the wall thereof and a valving mechanism comprising a hydraulic pressure retaining mechanism including lifter means said lifter means contacting said rocker shaft, said lifter means having a first oil chamber in fluid communication with the interior of the rocker arm, a second oil chamber located between said lifter means and a portion of the rocker arm, said second oil chamber being capable of being placed in fluid communication with said first oil chamber, a check valve in said second oil chamber for controlling the flow of oil between said first and said second oil chambers, and a return spring positioned in said second oil chamber between said lifter means and a portion of the rocker arm.

4,104,997

MULTIPLE SLOPE IGNITION SPARK TIMING CIRCUIT

Kenneth Warren Padgitt, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 20, 1976, Ser. No. 650,655
Int. Cl.² F02P 5/04
U.S. Cl. 123—117 R **37 Claims**



1. A multiple slope ignition spark timing circuit for an internal combustion engine comprising:

sensor means for generating an AC input signal having a frequency proportional to the rotational speed of an en-

gine, said input signal having alternate positive and negative cycles with respect to a predetermined reference level, each of said cycles corresponding to predetermined amounts of angular rotation of the engine;

means for receiving said AC input signal and producing a first signal, after each commencement of one of said positive and negative cycles, which is varying at a first predetermined rate of change;

means coupled to said sensor means for receiving said input signal and detecting the passage of at least a first predetermined period of time within a first predetermined amount of angular rotation of the engine after each commencement of one of said cycles, said first predetermined amount of angular rotation being at most equal to the angular rotation corresponding to one positive and one negative cycle;

means coupled to said first signal producing means for altering the rate of change of said first signal to a second predetermined rate of change in response to the occurrence of a detection of said first time period within said first amount of angular rotation; and

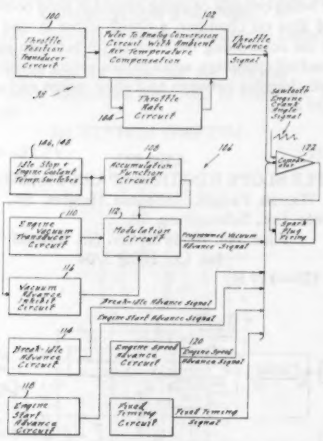
means, including comparison means, coupled to said first signal producing means for producing a spark timing ignition signal by utilizing the magnitude of said first signal with respect to an engine speed independent reference level to produce an engine speed variable phase difference between said spark timing signal and said input signal, a first spark timing phase difference versus engine speed relationship depending on said first rate of change existing when the engine speed is above a predetermined speed at which said first time interval equals the time required for said first predetermined amount of angular rotation of the engine, and a second relationship depending on both said first and second rates of change existing when the engine speed is below said predetermined speed.

4,104,998

ENGINE CONTROL SYSTEM

Gordon William Fenn, Mt. Clemens, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 25, 1975, Ser. No. 570,671
Int. Cl.² F02P 5/04; F02H 3/00
U.S. Cl. 123—117 R **73 Claims**



1. In an internal combustion engine having throttle control means for controlling throttle position and having a spark ignition system including spark timing control means for controlling the engine angle at which spark ignition occurs relative to a fixed engine angle, the improvement comprising:

means for generating a throttle advance signal representative of throttle operation including,

transducer means directly connected to and operable by said throttle control means to provide a transducer output signal representative of throttle position,

means operatively coupled with said transducer means for generating from said transducer output signal said throttle advance signal as a function of both throttle position and rate of change of throttle position, and

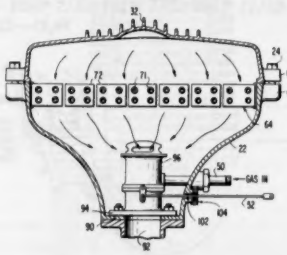
means for supplying said throttle advance signal to said spark timing control means.

4,104,999

AFTER-COOLER ACCESSORY UNIT FOR INTERNAL COMBUSTION ENGINE HAVING A CARBURETOR

Robert L. Ullrich, P. O. Box 899, Roswell, N. Mex. 88201

Filed Apr. 8, 1977, Ser. No. 785,890
Int. Cl.² F02B 29/04
U.S. Cl. 123—119 CD **10 Claims**



1. An after-cooler accessory unit for an internal combustion engine having a supercharger for compressing ambient air and discharging the compressed air through a discharge port to the carburetor of the engine, said unit comprising:

a housing adapted to enclose the carburetor of the engine and having an air inlet and an air outlet;

means for coupling said inlet to the discharge port of the supercharger;

means for securing said housing to the engine and sealing said outlet of said housing to the air intake of the carburetor; and

heat exchanger means mounted in said housing in the path of the compressed air for cooling the compressed air received from the supercharger.

4,105,000

FUEL INJECTION MECHANISM

Wolf Wessel, Oberriexingen, and Wolfgang Ripper, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 15, 1976, Ser. No. 741,641
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1976, 2607367
Int. Cl.² F02M 39/00, 11/00
U.S. Cl. 123—139 AW **4 Claims**

1. A fuel injection mechanism for mixture compressing, externally ignited internal combustion engines for mounting within the air suction tube of the engine, comprising:

a bearing axle;

an air measuring element mounted within the air suction tube by the bearing axle;

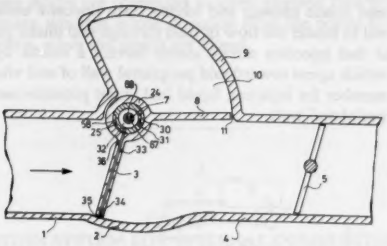
restoring force means connected to the air measuring element and the air suction tube for applying a restoring force to the air measuring element in response to displacements of the air measuring element by the air quantity flow through the air suction tube;

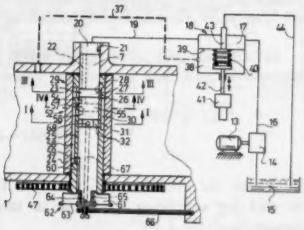
a fuel quantity apportionment valve having a movable component which is movable with the air measuring element

for apportionment of a fuel quantity proportional to the air quantity flow through the air suction tube;

an auxiliary fuel valve having a movable component which is movable with the air measuring element for apportionment of an auxiliary fuel quantity proportional to the air quantity flow through the air suction tube;

fuel injection means operatively associated with the air measuring element for injecting fuel into the air suction tube;





a temperature dependently controlled pressure regulating valve connecting to the auxiliary fuel valve downstream thereof in the direction of flow of the auxiliary fuel from the auxiliary fuel valve and operative during engine warm-up to control the auxiliary fuel flow from the auxiliary fuel valve for delivery to the fuel injection means, said fuel injection means receiving and injecting the fuel apportioned by the fuel quantity apportionment valve and the auxiliary fuel valve.

4,105,001

CONTROL MECHANISM FOR OPERATION OF AN INTERNAL COMBUSTION ENGINE

Günter Hartel, Neuss-Rosellen, Germany, assignor to Pierburg GmbH & Co KG, Neuss, Germany

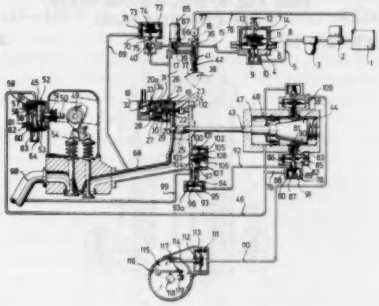
Filed Oct. 29, 1976, Ser. No. 736,934

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1975, 2548985

Int. Cl.[2] F02D *1/06*; F01N *3/00*

U.S. Cl. 123—140 CC **6 Claims**

1. A control mechanism for operation of an internal combustion engine having a throttle, a plurality of cylinders and a three-dimensional cam (**38**) formed with first and second curved surfaces (**37**), the first surface being dependent in cam position from a changeable operating parameter and an arbitrary change in position of the throttle, comprising a control unit (**16**) for determining the total fuel consumption both for the operatively warm and the operatively cold engine, an exhaust gas return valve (**93***a*) and a first control valve (**78**) for controlling said exhaust gas return, and a firing point controller (**116**) and a second control valve (**109**) for controlling said firing point controller, said control unit (**16**) and said control valves (**78, 109**) being controlled by at least one of said curved surfaces (**37**), said engine including a fuel feed line (**15**) and a suction tube, and further comprising a first regulatory nozzle area (**36**) formed in said fuel feed line (**15**) and controlled by said three-dimensional cam (**38**), a magnetically controlled regulatory nozzle are (**39**) for enrichment of the engine's starting fuel mixture, a regulatory nozzle are (**40**) for fuel enrichment for the purpose of accelerating the engine and controlled



through the part-vacuum in said suction tube, the latter two nozzle areas (**39, 40**) being formed in said fuel feed line (**15**) in parallel with the first nozzle area (**36**), a pressure regulator (**18**) controlled dependent on temperature of cooling water and a pre-atomizer (**132**) fed by said pressure regulator (**18**), the entire fuel being fed to said pre-atomizer (**132**).

4,105,002

PNEUMATIC CONTROLLER FOR AN INJECTION PUMP, ESPECIALLY FOR DIESEL ENGINES

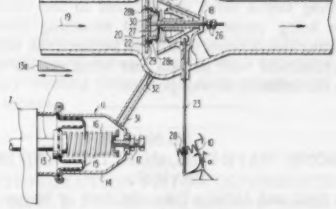
Frank Thoma, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Jan. 19, 1976, Ser. No. 650,067

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1975, 2502387

Int. Cl.[2] F02D *1/14*

U.S. Cl. 123—140 MP **34 Claims**



1. A pneumatic controller for an injection pump operable to vary the quantity of injected fuel and having a quantity adjusting means, the pneumatic controller comprising a pneumatic actuating means at least indirectly influencing the quantity adjusting means of the injection pump for displacing the quantity adjusting means in case of an actuation with vacuum in a direction toward smaller injection quantities, at least one force storage means for influencing at least indirectly the quantity adjusting means in a direction toward an increase of the injected quantities, and a drive lever means actuatable at will characterized in that means are provided for at least indirectly elastically connecting the drive lever means with the controller, further means are provided in the controller for supplying a correspondingly large vacuum only in accordance with respective deflected positions of the drive lever means, and in that a connection means is arranged between a vacuum con-

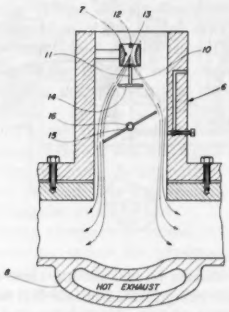
nection of said further means and the pneumatic actuating means acting on the quantity adjusting means.

4,105,003

FUEL DISTRIBUTION SYSTEM

Raymond E. Funk, 9 Chapman Dr., Lexington Park, Md. 20653

Filed Aug. 8, 1975, Ser. No. 603,187
Int. Cl.² F02M *29/00*
U.S. Cl. 123—141 **3 Claims**



1. In a fuel distribution system having a carburetor for combining a fuel spray with air passing therethrough, the carburetor including a venturi for introducing the fuel spray into the air, the carburetor further including a cylindrical wall portion defining a passageway, the combined fuel and air passing from the venturi through the passageway, a butterfly valve being located within the passageway and operable to vary the sizes of the two openings between opposed ends of the butterfly valve and the wall portion of the carburetor on opposite sides of a diameter of the passageway in order to regulate the flow of the combined fuel and air through the passageway, the improvement comprising:

a baffle mounted to the venturi and positioned between the venturi and the butterfly valve to evenly distribute the combined fuel and air to the two openings defined by the opposed ends of the butterfly valve and the wall portion of the carburetor; and

a mounting sleeve fitted and secured to the venturi, said baffle being connected to said mounting sleeve, said mounting sleeve being positioned between the venturi and the cylindrical wall portion and being spaced inwardly from the cylindrical wall portion.

4,105,004

ULTRASONIC WAVE FUEL INJECTION AND SUPPLY DEVICE

Kiyokazu Asai, and Akihiro Takeuchi, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Nov. 4, 1976, Ser. No. 738,843
Claims priority, application Japan, Nov. 4, 1975, 50-132701
Int. Cl.² F02M *27/08*
U.S. Cl. 123—141 **21 Claims**

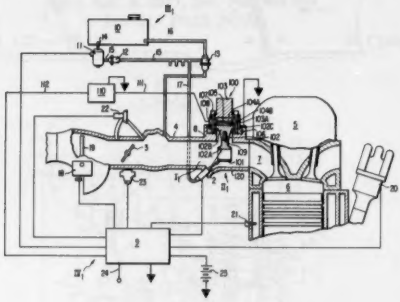
1. An ultrasonic wave fuel injection and supply device comprising:

an intake passage, for supplying an air-fuel mixture therethrough, one end of which is communicated with an air cleaner and the other end of which is communicated with a combustion chamber in an internal combustion engine;

fuel injection means having an ultrasonic wave generating means and a fuel injection nozzle means;

said ultrasonic wave generating means comprising an ultrasonic transforming means, for transforming electrical oscillations into mechanical vibrations, connected to an ultrasonic oscillator, a mechanical vibration amplifying means, for amplifying the amplitude of said mechanical vibrations, secured at one end thereof to said ultrasonic transforming means, and a vibratory member, having a hollow, cylindrically shaped body, a peripheral wall of which is secured to the other end of said mechanical vibration amplifying means, the axis of said vibratory member being positioned substantially perpendicular to the longitudinal axis of said mechanical vibration amplifying means, and said vibratory member being positioned in said intake passage and having open opposite ends so as not to hinder the flow of fluid through said intake passage;

said fuel injection nozzle means having a nozzle opening which opens toward said peripheral wall of said vibratory member for injecting liquid fuel under pressure onto said peripheral wall;



fuel supply means for introducing liquid fuel from a fuel reservoir and for supplying the same to said injection nozzle means; and

control means for controlling the amount of fuel being injected through said injection nozzle means in accordance with the running conditions of said internal combustion engine,

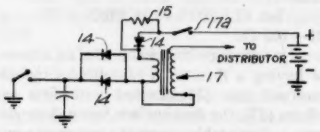
whereby liquid fuel injected onto said peripheral wall of said vibratory member undergoing ultrasonic vibration may be atomized and scattered due to the ultrasonic vibration thereof, the liquid fuel thus being atomized and scattered being supplied to a combustion chamber of said engine, together with air from said air cleaner.

4,105,005

ELECTRONIC IGNITION

William Phillips, 1815 Sweetbriar, Palo Dale, Calif. 93550

Filed Feb. 17, 1976, Ser. No. 658,823
Int. Cl.² F02P *3/04*; H05B *41/392*
U.S. Cl. 123—148 E **1 Claim**



1. An ignition system consisting essentially of a distributor and battery, the negative terminal connected to ground;

an ignition coil comprising a primary and a secondary winding, a first terminal of the secondary winding connected to a first terminal of said primary winding, the second terminal of said secondary winding connected to the distributor;

a first diode, said first diode cathode connected to the second

terminal of said primary winding, the first diode anode connected the positive terminal of said battery;

a set of points, one contact being grounded;

a second diode, said second diode cathode connected to the ungrounded contact of said points, the second diode anode connected to the first terminal of said secondary winding, and

a condenser in parallel with said points;

wherein diodes are connected to allow electron flow in the primary winding in one direction from the points to the battery, when the points are closed.

4,105,006

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

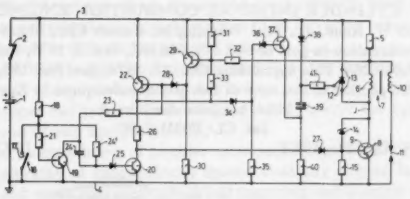
Werner Jundt, Ludwigsburg; Peter Werner, Stuttgart; Bernd Bodig, Leinfelden; Gerhard Söhner, Remshalden-Geradstetten, and Helmut Roth, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 9, 1976, Ser. No. 703,780

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1975, 2531278

Int. Cl.² F02P *3/02*

U.S. Cl. 123—148 E **13 Claims**



1. Ignition system for an internal combustion engine adapted for connection to a current supply source (1) having an ignition coil (7), a main switch (8) serially connected with the ignition coil (7) to control current flow therethrough;

a sensing resistor (5) serially connected with the primary of the coil (7) sensing current flow through the primary (6) of the ignition coil (7) and providing a respective sensing signal;

a shunt circuit comprising an auxiliary controlled switch (13) connected in shunt with the primary (6) of the ignition coil (7) and the sensing resistor (5),

control circuit means (29, 22) connected to said sensing resistor (5), responsive to said sensing signal, sensing a predetermined current flow through the coil (7) and controlling the respective switching states of the main switch (8) and of the auxiliary switch (13) to be alternatively conductive to store ignition energy in the coil during conduction of the main switch (8) and non-conduction of the auxiliary controlled switch (13) and to disconnect the primary of the coil from the power source (1) during opening of the main switch and establishment of a closed series circuit formed by said then closed auxiliary controlled switch (13), the sensing resistor (5) and the primary (6) of the ignition coil;

and an interrupt control switch (16) connected to and controlling opening of said main switch to control the timing of the ignition instant independently of sensed current flow through said sensing resistor (5).

4,105,007

DEVICE FOR SUPPRESSING IGNITION NOISE

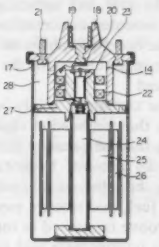
Masayoshi Mochimaru, 25-20, Akabanedai 3 chome, Kita-ku, Tokyo, Japan

Filed Sep. 3, 1976, Ser. No. 720,381

Claims priority, application Japan, Apr. 2, 1976, 51-36132

Int. Cl.² H04B *3/28*

U.S. Cl. 123—148 P **2 Claims**



1. A device for suppressing ignition noise, inserted in series with the secondary high voltage circuit of an ignition coil, said device comprising:

(a) a cylindrical housing;

(b) a support means positioned in said housing for dividing said housing into axially aligned first and second compartments;

(c) noise suppression means mounted in said first compartment, said noise suppression means including a choke coil having an air core bobbin at the center of said support means, an inductive coil having a plurality of honey-comb sections wound on said bobbin and a resistor mounted inside of said bobbin wherein said inductive coil and said resistor are connected electrically in parallel;

(d) a high voltage terminal positioned in said first compartment, said noise suppression means having one terminal connected to said high voltage terminal;

(e) an ignition coil means mounted in said second compartment, said ignition coil means including a core, and a primary and secondary winding wound on said core, said secondary winding being electrically connected to said core; and

(f) spring means positioned between said noise suppression means and said core for electrically connecting said secondary winding through said core to said noise suppression means.

4,105,008

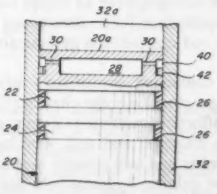
ANTI-POLLUTION PISTON CONSTRUCTION

Edwin L. Resler, Jr., Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sep. 4, 1975, Ser. No. 610,296

Int. Cl.² F02F *1/24*

U.S. Cl. 123—191 R **2 Claims**



1. An anti-pollution internal combustion engine of the type

including ignition means for igniting a combustible hydrocarbon fuel-air mixture, comprising

(a) A cylinder having an inner wall surface;

(b) a cylindrical piston mounted for reciprocation in said cylinder, said piston having at one end an imperforate continuous end wall which cooperates with said cylinder to define a combustion chamber, and a cylindrical side wall of said piston containing at least one piston ring groove.

(c) a piston ring mounted concentrically within said piston ring groove, the outer periphery of said piston ring being in contiguous engagement with the inner wall surface of said cylinder; and

(d) storage means contained solely within said piston for receiving from the combustion chamber unburnt hydrocarbons during the compression stroke of the engine and for returning the unburnt hydrocarbons to the engine cylinder during the subsequent expansion stroke following ignition of the fuel, said storage means including

(1) a second groove contained in the cylindrical side wall of said piston intermediate said piston ring groove and said imperforate end wall, said second groove being in continuous communication with said combustion chamber via the annular space between the end extremity of said piston and the wall surface of said cylinder;

(2) at least one storage chamber contained in said piston;

(3) means including a plurality of radial passages and orifices affording communication between said storage chamber and said second groove, whereby during the expansion stroke following ignition, the unburnt hydrocarbons are returned to the engine cylinder so that their jetting action scours the inner wall surface of said cylinder and removes additional unburnt hydrocarbons from the wall, and introduces unburnt hydrocarbons from the storage chamber and the wall into the combustion gases for mixing with the oxides of nitrogen to reduce said oxides to the equilibrium value; and

(4) an annular seal member mounted for axial sliding movement between open and restricting positions relative to said orifices, thereby to vary the effective size of said orifices.

4,105,009

ANTI-POLLUTION ENGINE HEAD CONSTRUCTION

Edwin L. Resler, Jr., Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 610,298, Sep. 4, 1975, abandoned. This application Apr. 8, 1977, Ser. No. 786,052

Int. Cl.[2] F02F *1/02*

U.S. Cl. 123—193 H **6 Claims**

1. An anti-pollution internal combustion engine of the piston and cylinder type, comprising

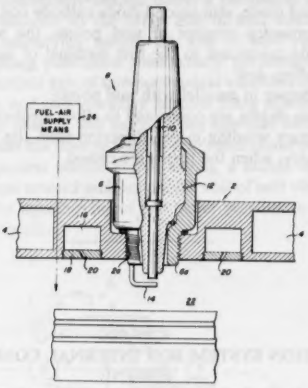
(a) means including a unitary metal head (2) cooperating with a piston and cylinder to define a working chamber (22), said head containing a threaded opening (2*a*) for receiving a spark plug (6); and

(b) means (24) for supplying combustion fuel to said working chamber for ignition by said spark plug, said fuel supply means causing operation of the engine in a mode in which the oxides of nitrogen have an excess concentration relative to an equilibrium value determined by the pressure, temperature and composition parameters of the combustion gases;

(c) said head containing immediately adjacent said spark plug opening a closed storage chamber (16), and passages means (20) affording continuous communication between said storage chamber and said working chamber, said storage chamber and said passage means being arranged

(1) to receive unburnt hydrocarbons during the compression stroke of the engine, and

(2) to return the hydrocarbons to the working chamber during the subsequent expansion stroke following combustion of the fuel for mixing with the oxides of nitrogen to reduce the same to the equilibrium value;



(d) said head further containing cooling passage means (4) immediately adjacent said closed storage chamber.

4,105,010

FUEL SAVING APPARATUS FOR MULTIPLE CYLINDER INTERNAL COMBUSTION ENGINES

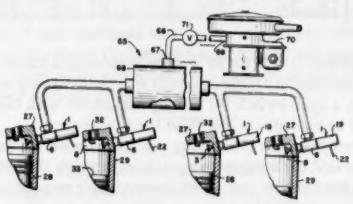
Earl W. Rand, Jr., 2101 Washington, Kansas City, Mo. 64108

Continuation-in-part of Ser. No. 646,361, Jan. 2, 1976, Pat. No. 4,018,204. This application Dec. 13, 1976, Ser. No. 750,124

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.[2] F02D *9/00*

U.S. Cl. 123—198 F **10 Claims**



1. In a multiple cylinder internal combustion engine including a carburetor and a plurality of cylinders each of which has a piston, said cylinders respectively forming a combustion chamber clearance volume above said respective pistons, and an intake and exhaust valve associated with said respective cylinders, the improvement of a device rendering temporarily ineffective selected engine cylinders during low engine power demand periods for reducing fuel consumption, said device comprising:

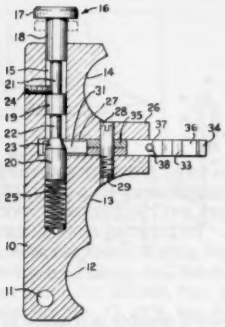
(a) an independently controlled fuel saving third valve member operably associated with at least one of the cylinders so as to provide communication between said clearance volume and a reservoir volume disposed externally thereof during the low engine demand periods;

(b) said third valve member, when open, severely reducing cylinder intake vacuum and resultant air-fuel influx to the extent that said one cylinder is rendered temporarily ineffective during the low engine demand periods, thereby reducing engine fuel consumption.

4,105,011
ARCHERY BOWSTRING RELEASE

Van B. Chism, 1323 Hwy. 35, Benton, Ark. 72015

Filed Sep. 23, 1977, Ser. No. 836,179
Int. Cl.² F41B 5/00
U.S. Cl. 124—35 A 10 Claims



1. An archery bowstring release comprising:

a generally T-shaped body member positioned in a lazy T posture and including a longitudinally extending upright portion and a forwardly projecting portion extending perpendicularly therefrom at an elevation intermediate the ends of the upright portion;

a blind bore extending downward longitudinally from the upper end of said upright portion to an elevation below its junction with said projecting portion;

a slidable plunger slip-fitted into said bore, the lower end of said plunger being positioned below said junction and an upper end portion projecting upwardly above the upper end of said upright portion;

said plunger being of circular cross section and including a plurality of longitudinally spaced coaxially aligned large and small diameter cylindrical segments and a single upstanding conical frustum segment;

a cavity extending inwardly in communication with said bore from the forward end of said projecting portion and a pair of coextensive jaw members pivotally mounted intermediate their respective ends in non-intersecting relationship on said forwardly projecting portion;

said jaw members extending rearwardly into said cavity and having their rearward end portions straddling the large diameter plunger segment adjacent to the base of said conical segment and said jaw members extending forwardly beyond said body member and having therein a pair of opposed complementary bowstring retaining notches, the outer ends of said jaws abutting for retaining a bow string in said notches;

main spring means yieldably urging said plunger upwardly from the lower end of said bore and detent means fixed to said body member in the path of upward movement of said plunger;

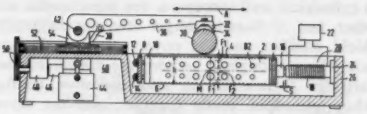
auxiliary spring means biasing the foward portions of said jaw members apart and concurrently biasing the rearward portions of said jaw members about said pivotal mounting into engagement with said plunger;

a small diameter segment of said plunger being positioned adjacently above the plunger engaging portions of said jaw members, said last-named segment moving downwardly between the plunger engaging portions upon the occurrence of a downward movement of the upper projecting end portion of the plunger to release a bowstring from said bowstring retaining notches.

4,105,012
APPARATUS FOR CUTTING UP HARD AND BRITTLE MATERIAL

Paul Hini, Erlangen, and Helmut Foster, Neunkirchen am Brand, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 713,575, Aug. 11, 1976, abandoned.
This application Oct. 19, 1977, Ser. No. 843,417
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1975, 2537088
Int. Cl.² B28D 1/02
U.S. Cl. 125—16 R 10 Claims



1. Apparatus for cutting up hard brittle material comprising

(a) a base member;

(b) a clamping frame;

(c) a plurality of leaf springs supporting said frame on said base for oscillating motion along a first axis, said leaf springs disposed transversely to said first axis;

(d) a plurality of saw blades disposed side by side in said clamping frame said saw blades extending in a direction parallel to said first axis;

(e) means for holding material to be cut up and for bringing said material into contact with said saw blades;

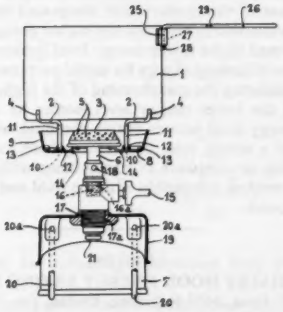
(f) first drive means for imparting a high frequency low amplitude oscillating motion to said support frame; and

(g) second drive means for imparting a large amplitude low frequency to and fro motion to said means for holding said material to be cut up.

4,105,013
PORTABLE STOVES

Marcel Vache, Sainte-Foy-les-Lyon, France, assignor to Application Des Gaz, Saint Genis Laval, France

Filed Sep. 13, 1976, Ser. No. 722,901
Claims priority, application France, Sep. 23, 1975, 75 29695
Int. Cl.² F24C 5/20
U.S. Cl. 126—38 11 Claims



1. Portable cooking apparatus including a dismountable stove for attachment to a liquid gas cartridge, and including two telescopable saucepans within which the stove is storable when not in use, said apparatus comprising:

a stove including a burner head supported in the center of an upwardly-opening dished wind shield member, the burner head having a connecting tube extending downwardly through a hole in the center of the shield member and

having a threaded lower end, and the stove having a downwardly opening dished cover member below the end of the tube and shaped to receive a gas cartridge therein, and the stove having a gas cock member having a threaded upper end connectable to said tube and having a lower end extending through a central hole in the cover member and into communication with the gas in the cartridge when the stove is assembled in operative configuration, and the stove having pan supporting arms carried by said wind shield member, the arms being extensible from the shield member to support a saucepan and being retractable within the peripheral contour of the shield member; and

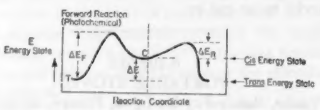
two cylindrical wall saucepans, one telescopable within the other, and of diameter larger than the diameters of the shield member and the cover member, the saucepans being long enough to receive the assembled stove and cartridge therewithin in said operative configuration when telescoped partly together, and the stove being partly dismountable to a smaller configuration wherein the cover member is inverted to nest about said shield member with the gas cock member lying disassembled between the shield member and the cover member, and the stove thus configured being enclosable inside the saucepans which are telescoped further together.

4,105,014

CATALYTIC EXTRACTION OF STORED SOLAR ENERGY FROM PHOTOCHEMICALS

Robert E. Schwerzel; Nancy E. Klosterman; John Robert Kelly, and Louis J. Hillenbrand, all of Columbus, Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Jan. 24, 1977, Ser. No. 761,912
Int. Cl.[2] F24H *7/00*
U.S. Cl. 126—270 **8 Claims**



1. In the photochemical process for collection and retrieval of solar energy wherein a lower energy level isomer of an isomerizable compound, while contained in a fluid, is exposed to solar energy of a wavelength providing a higher energy level isomer of the isomerizable compound and then subsequently, while within the fluid, the higher energy level isomer is transformed to the lower energy level isomer with exothermic release of thermal energy for useful purposes, the improvement of: initiating the transforming of the higher energy level isomer to the lower energy level isomer by contacting the higher energy level isomer within the fluid with a chemical catalyst of a strong acid, or a strong base, or a mixture of strong acids, or a mixture of strong bases with the employed chemical catalyst compatible with the fluid and the isomerizable compound.

4,105,015

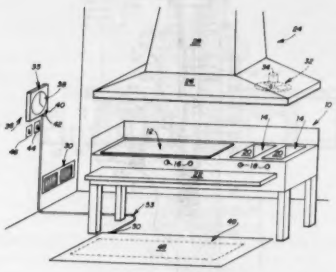
EXHAUST HOOD ENERGY SAVING DEVICE

William C. Isom, 9430 Folkstone, Dallas, Tex. 75220, assignor to William C. Isom, Dallas, Tex.

Filed Mar. 9, 1977, Ser. No. 775,781
Int. Cl.[2] F24C *15/20*; F23J *11/00*
U.S. Cl. 126—299 D **15 Claims**

1. In an exhaust ventilation system for conserving energy lost by exhausting the air conditioning from the interior of a building along with the by-products generated by the process of cooking food at a cooking station, the ventilation system including a ventilation hood positioned over the cooking station and having ducting communicating with the outside environment and an exhaust fan for removing the by-products of cooking food from the area of the cooking station through the ducting of the ventilation system to the outside, the improvement comprising:

exhaust control means connected to the exhaust fan and automatically responsive to the presence and absence of a cook at the cooking station,



a timed switch operable in response to said control means to switch to a first position when the cook is present at the area of the cooking station and further operable to switch to a second position a predetermined period of time after the cook leaves the area of the cooking station; and

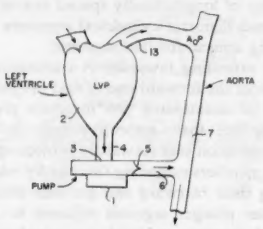
means responsive to the first position of said timed switch and connected to the exhaust fan for energizing the exhaust fan to run and responsive to the second position of said timed switch for deenergizing the exhaust fan.

4,105,016

HEART PUMP

Francis M. Donovan, Jr., 6300 Old Canton Rd., Jackson, Miss. 39211

Filed Nov. 18, 1976, Ser. No. 742,883
Int. Cl.[2] A61F *1/24*
U.S. Cl. 128—1 D **4 Claims**



1. A system for reducing the pressure in the left or right ventrical of a heart pump comprising:

a centrifugal pump means operated at a constant speed, said pump means having an inlet and an outlet and having a valve means placed in said outlet or inlet, said valve means being of the type commonly used for heart valves;

a first cannula having one end attached to the inlet of said pump means, the other end of said cannula being adapted to be inserted into the ventricle to be assisted;

a second cannula having one end attached to the outlet of said pump means, the other end of said second cannula being adapted to be attached to a natural artery;

a first tube attached to said pump means;

a second inner tube placed inside of said first tube, said inner tube supplying cooling air to the motor of said pump means, said cooling air being returned to the atmosphere through said first tube; and

a pair of electrical wires placed in between said second inner

tube and said first tube, said wires supplying electrical power to said motor.

4,105,017

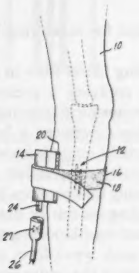
MODIFICATION OF THE GROWTH REPAIR AND MAINTENANCE BEHAVIOR OF LIVING TISSUE AND CELLS BY A SPECIFIC AND SELECTIVE CHANGE IN ELECTRICAL ENVIRONMENT

John P. Ryaby, Essex Fells, and Arthur A. Pilla, Wyckoff, both of N.J., assignors to Electro-Biology, Inc., Fairfield, N.J.

Continuation-in-part of Ser. No. 633,408, Nov. 19, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,706

Int. Cl.[2] A61N *1/40*

U.S. Cl. 128—1.5 **50 Claims**



1. A surgically non-invasive method of treating living tissues and/or cells comprising electromagnetically inducing voltage and concomitant current pulses of a specific frequency-amplitude relation within said tissue and/or cells, wherein said pulses satisfy the following criteria:

(a) each pulse is composed of a positive pulse-signal portion followed by a negative pulse-signal portion;

(b) each positive pulse signal portion is composed of at least three segments, of which the peak amplitude of the final segment is no less than about 25 percent of the peak amplitude of the first segment;

(c) the duration of each positive pulse signal portion is between about 200 microseconds and 1 millisecond, and is no longer than about 1/9 the duration of the following one of the negative pulse signal portions;

(d) the repetition rate of the pulses is between about 10 and 100 Hz;

(e) each positive pulse signal portion has an average amplitude of between about 0.0001 and 0.01 volts per centimeter of treated tissue and/or cells corresponding to between about 0.1 and 10 microamperes per square centimeter of treated tissue and/or cells;

(f) each negative pulse signal portion has an average amplitude no greater than about 1/6 the average amplitude of each positive pulse signal portion;

(g) each negative pulse signal portion has a peak amplitude from which it exponentially decays to about a zero reference level, and said negative pulse signal portion peak amplitude is no greater than about ½ the peak amplitude of said positive pulse signal portion.

4,105,018

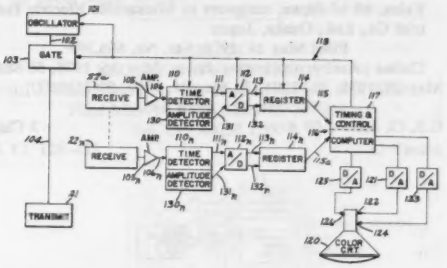
ACOUSTIC EXAMINATION, MATERIAL CHARACTERIZATION AND IMAGING OF THE INTERNAL STRUCTURE OF A BODY BY MEASUREMENT OF THE TIME-OF-FLIGHT OF ACOUSTIC ENERGY THERETHROUGH

James F. Greenleaf, and Steven A. Johnson, both of Rochester, Minn., assignors to University of Utah, Salt Lake City, Utah

Filed Feb. 2, 1976, Ser. No. 654,419

Int. Cl.[2] A61B *10/00*

U.S. Cl. 128—2 V **30 Claims**



1. A method of examining the internal structure of a body comprising the steps of:

(a) transmitting acoustic energy through said body from a plurality of different directions;

(b) measuring the time-of-flight of the acoustic energy through the body; and

(c) mathematically reconstructing the acoustic velocity at a plurality of points within said body.

4,105,019

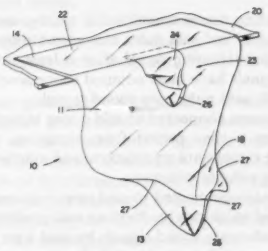
METHOD FOR COLLECTING POSTPARTUM FLUID LOSS

John N. Haswell, 607 Dubois St., Vincennes, Ind. 47591

Division of Ser. No. 657,161, Feb. 11, 1976, Pat. No. 4,076,017. This application Apr. 25, 1977, Ser. No. 790,553

Int. Cl.[2] A61B *10/00, 19/06*

U.S. Cl. 128—2 F **4 Claims**



1. A method for collecting postpartum fluid loss which comprises:

providing a postpartum fluid loss receptacle having a first sheet of flexible material that is essentially nonabsorbent to body fluids, the first sheet having a first end portion forming a first pocket and a second end portion, the first end portion of the first sheet being folded and defining a first edge and a second edge, the edges having a common point, the first edge being sealingly attached to the second edge continuously along a line extending from the common point, the receptacle further including a second pocket smaller than the first pocket;

placing the second end portion of said first sheet of the

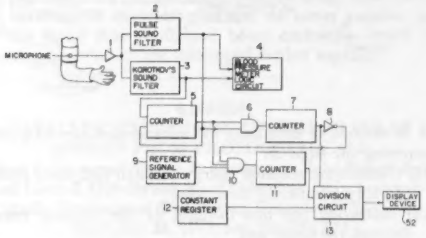
receptacle under the buttocks of a patient, said second pocket being positioned under the flap of said first sheet;
collecting primarily the amniotic fluid in the first pocket of said first sheet;
opening said second pocket; and
collecting primarily the blood within said second pocket.

4,105,020

BLOOD PRESSURE AND PULSE RATE MEASURING APPARATUS

Yoshifumi Matsuoka, Yamatotakada; Takemasa Matsumura, Toyonaka; Koichi Shigematsu, Kawanishi, and Atsushi Oishi, Yaizu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 14, 1976, Ser. No. 686,395
Claims priority, application Japan, May 16, 1975, 50-58815; May 29, 1975, 50-73201[U]; May 29, 1975, 50-73202[U]
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 A **3 Claims**



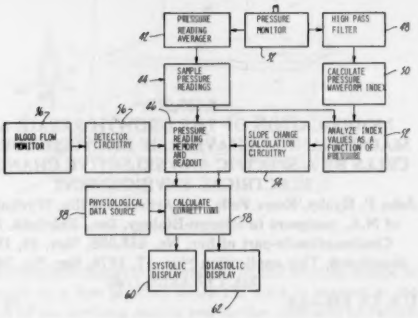
1. In a blood pressure measuring apparatus having a blood pressure meter logic circuit for determining a patient's systolic and diastolic blood pressures utilizing a Korotkoff's sound signal and a heart beat signal, the improvement which enables simultaneous measurement of blood pressure and pulse rate comprising:
a microphone associated with a cuff device for producing an electric signal containing a Korotkoff's sound signal and a pulse rate sound signal;
filter means connected to said microphone for separating said Korokoff's sound signal and said pulse rate sound signal;
count initiating means connected to receive said Korotkoff's sound signal and said pulse rate sound signal for producing a count initiating signal after at least two Korotkoff's sound signals have been counted successively in synchronism with said pulse rate sound signal;
counting means connected to said count initiating means for measuring a time period from reception of said count initiating signal until a predetermined number of pulse rate sound signals are counted;
division means connected to said counting means for calculating said pulse rate by dividing said predetermined number of pulse rate sound signals by said time period;
means for providing a signal indicating completion of a diastolic blood pressure measurement by said blood pressure meter logic;
means for providing a signal indicative of termination of counting of said predetermined number of pulse rate sound signals by said counting means;
means for generating a signal indicating completion of both the blood pressure measurement and the pulse rate measurement, said signal generating means generating said completion signal in response to receipt of said signal indicating completion of said diastolic blood pressure measurement and said signal indicating termination of counting; and,
display means connected to said division means for displaying the calculated pulse rate.

4,105,021

METHOD AND ARRANGEMENT FOR MEASURING BLOOD PRESSURE

William J. Williams, and William J. Heetderks, both of Ann Arbor, Mich., assignors to Joseph H. Allen and Leonard S. Weisman, both of Madison Heights, Mich.

Filed Aug. 13, 1976, Ser. No. 714,097
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 A **18 Claims**



18. An arrangement for measuring blood pressure in a subject comprising:
means for occluding blood flow in a body member, including means for applying a pressure force to said body member, said means further including means for changing said pressure force between a level wherein said blood flow is substantially occluded and a level wherein blood flow is substantially unoccluded;
means for monitoring said pressure force, during said change in levels, including means for detecting variations in said pressures induced by blood pressure pulses;
means analyzing each wave form constituted by said pressure variations over the entire course of each blood pressure pulse;
means analyzing the changes in wave form of said pressure variations produced by successive changed in pressure applied by said occluding means;
means for detecting a change in the successive changes of said wave form at said pressure level corresponding to unoccluded blood flow;
means for determining the average pressure monitored by said monitoring means at said pressure level, whereby said pressure level corresponding to diastolic pressure is measured.

4,105,022

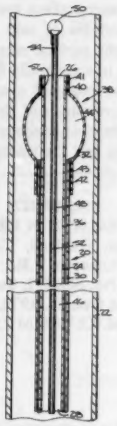
METHOD OF DETERMINING CARDIAC OUTPUT BY THERMODILUTION PRINCIPLES AND UTILIZATION OF A CATHETER ASSEMBLY

William T. Antoshkiw, Clifton, and Thomas A. Ursic, Hasbrouck Hts., both of N.J., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Division of Ser. No. 689,487, May 24, 1976, Pat. No. 4,024,873. This application Nov. 19, 1976, Ser. No. 743,464
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 F **5 Claims**

1. A method for determining cardiac output by means of thermodilution principles and by utilizing a catheter assembly with a passageway therethrough comprising; introducing the catheter assembly at least into close proximity to the right heart, inserting a small balloon tipped catheter with the balloon uninflated through the passageway of the catheter assembly and with a thermistor attached thereto with the passageway of the catheter assembly forming a guideway for directing the small balloon catheter to the desired location, passing the

balloon tipped portion of the small catheter out of the passageway of the catheter assembly into the bloodstream and inflating the balloon so that the balloon is flow directed away from the catheter assembly into the heart and spaced from the catheter assembly a substantial distance to facilitate prevention of interference between the passageway through the catheter assembly and the inflated tip portion of the small catheter, providing a central lumen in the small balloon tipped catheter



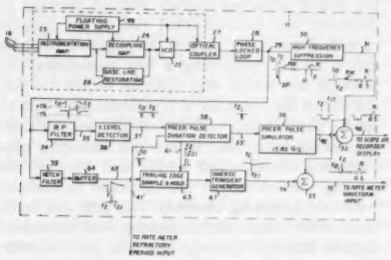
to effect the inflation and deflation of the balloon, injecting a fluid different in temperature from the blood stream into the annular space between the passageway of the catheter assembly and the outer surface of the inflated balloon tipped portion of the small catheter spaced therefrom whereby the thermistor of the balloon catheter detects the temperature changes in the bloodstream, and detecting the thermistor output to determine cardiac output.

4,105,023

PACEMAKER ARTIFACT SUPPRESSION IN CORONARY MONITORING

Thomas F. Marchese, Somerville, and Rauf S. Argon, Bedford, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jan. 19, 1977, Ser. No. 760,487
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—2.06 B **9 Claims**



1. In a heart monitoring system including means for sensing a patient's ECG signals, means responsive to the QRS complex of sensed ECG signals for indicating the patient's heart rate, and signal suppression means for suppressing the pacer discharge pulse portion of a heart pacer signal artifact possibly appearing in the sensed ECG signal to prevent false actuation of the heart rate indicating means thereby, the pacer signal artifact being comprised of the pacer discharge pulse portion and a recharge waveform portion, the improvement wherein said suppression means additionally incudes:

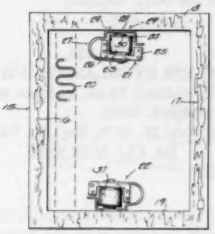
means responsive to a pacer signal artifact in the sensed ECG signal for generating a recharge waveform suppression signal of opposite polarity to the recharge waveform portion of the pacer signal, and means for arithmetically summing the recharge waveform suppression signal with the sensed ECG signal to additionally suppress said recharge waveform portion, the magnitude and duration of said recharge waveform suppression signal being such as to thereby also prevent false actuation of the heart rate indicating means by said recharge waveform portion of the pacer signal artifact.

4,105,024

MASSAGING FURNITURE

Marvin J. Raffel, 9010 N. 70th St., Milwaukee, Wis. 53223

Filed May 16, 1977, Ser. No. 797,218
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—33 **11 Claims**



1. In massaging furniture:

rigid means defining a closed path for conducting vibratory waves,

a plurality of nonrotating vibratory motors for imparting vibrations to said rigid means,

said motors each including a core, a magnet coil on said core, an armature and, means coupling said core and armature for vibrating relative to each other and for yieldingly holding them apart, one of said core and said armature of each motor being secured to said rigid means and the other being free to vibrate and impart said vibrations to said rigid means,

means for energizing the coil of one of said motors with electric signals at a first frequency to thereby produce vibratory waves at one frequency in said path in said rigid means,

means for energizing the coil of another of said motors with electric signals at a second frequency to thereby produce vibratory waves at a second frequency in said path for coacting with waves of said first frequency to result in production of interference waves in said rigid means, and

means for varying at least one of said frequencies so as to vary the frequency of the resulting interference waves and, thus, the massaging wave frequency.

4,105,025

SURGICAL SUPPORT

Yen Wang, 6883 Reynolds St., Pittsburgh, Pa. 15208, and Wen-Hsuan Chang, Gibsonia, Pa., assignors to Yen Wang, Pittsburgh, Pa.

Filed Nov. 12, 1976, Ser. No. 741,295
Int. Cl.[2] A61F *13/04*
U.S. Cl. 128—90 **5 Claims**

1. A method of producing a supportive wrapping for a body support comprising,

impregnating a bandage substrate with a crystallizable polyurethane comprised of the reaction product of a normally crystalline polyol selected from the group consisting of a

polyester diol and a polyether diol having a melting point below 121.1° C and a molecular weight greater than 750 and a polyisocyanate present in an amount between 5 and 45 percent by weight based on the total weight of the two constituents,

said impregnated bandage substrate being impregnated with a molten polyurethane polymer that is crystallizable in a predetermined, delayed time period at temperatures tolerable to human skin,

heating said bandage material to a temperature above the melting point of said polyurethane polymer and below a temperature intolerable to human skin,

said bandage substrate impregnated with said crystallized polyurethane having self-adhesive properties at elevated temperatures,

thereafter wrapping a body member with said heated bandage so that portions of said bandage adhesively adhere to other portions of said bandage and shaping said bandage so that it conforms to the form of the body member, and

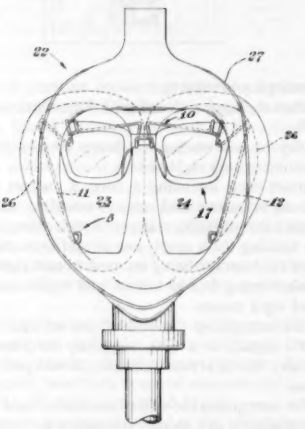
cooling said bandage to room temperature and permitting the polyurethane polymer to crystallize and harden on the bandage material to form the desired rigid supportive wrapping on the body member.

4,105,026

BOWLESS EYEGLASSES HOLDER

Robert A. Hay, II, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 26, 1976, Ser. No. 745,327
Int. Cl.[2] A62B 9/00
U.S. Cl. 128—142.4 **6 Claims**



1. A resiliently disengageable bowless eyeglasses holder for fixing bowless eyeglasses to a mask having a mask housing, said housing having at least one transparent eye covering and inner surface means extending around the periphery of the transparent eye covering, the holder comprising at lest one elongated, resilient element having:

(a) left, right and bridging members wherein the right and left members are connected by the bridging member member form a generally planar, U-shaped configuration, the right and left members forming the legs of the U and the bridging members forming the base of the U, said bridge member and said left and right members including generally hook-shaped means for engaging the bowless eyeglasses, the left and right members having said hook shaped means for engaging the top portions of the bowless eyeglasses frame at the temple connections and the center portion of said bridging member of said holder having said hook-shaped means for engaging under the bridging member of the bowless eyeglasses frame, the hook-shaped configurations of the left and right members located adjacent the respective left and right ends of the bridging member and the hook-shaped configuration of the bridging member located at about the center thereof, and

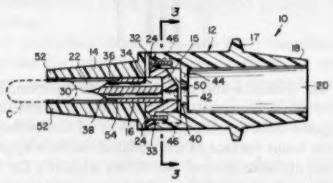
(b) the left and right members of the holder being resilient and including end portions adapted for engaging the mask at the inner surface means of the mask housing such that the holder is within the mask housing with the base of the U extending adjacent the top of the inner surface means of the mask housing and the legs of the U extending adjacent the sides of the inner surface means of the mask housing with said end portions of said left and right members engaging said inner surface means such that the holder engages the mask in a generally fixed position and in such a manner that the engaged eyeglasses are opposed the transparent eye covering and that a wearer of the mask can effectively see simultaneously through the engaged bowless eyeglasses and the transparent eye covering.

4,105,027

INHALATION DEVICE

Ingemar H. Lundquist, Oakland, Calif., assignor to Syntex Puerto Rico, Inc., Humacao, P.R.

Continuation of Ser. No. 586,771, Jun. 13, 1975, abandoned.
This application Oct. 26, 1976, Ser. No. 735,663
Int. Cl.[2] A61M 15/08
U.S. Cl. 128—206 **10 Claims**



1. A breath-actuated inhalation device for dispensing a medicament from a medicament-holding, cylindrical capsule having closed hemispherical ends, said device comprising

an elongate housing having a passageway for the movement of air therethrough, said housing having a first end and a second end, one of said ends being an output end adapted for insertion into the mouth or nasal passages of a user thereof, said passageway terminating in an emptying chamber adjacent the output end of said housing;

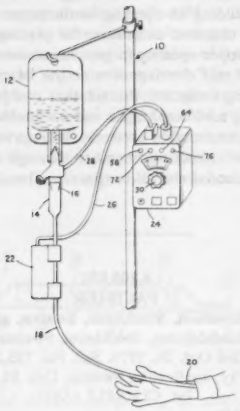
means for receiving a closed, medicament-holding, cylindrical capsule having closed hemispherical ends directly from the exterior of said device, said medicament-receiving means including sharply pointed piercing means to penetrate one hemispherical end of the capsule as the capsule is manually pushed thereagainst, first, communication means comprising a first passageway extending through and within said piercing means for placing the interior of the container in communication with the atmosphere surrounding said device, and second communication means comprising at least one additional passageway extending through and within said piercing means for placing the interior of the container in communication with said emptying chamber, said first and second communication means communicating with the interior of the capsule through openings near the point of said pointed piercing means, the capsule being otherwise closed to the atmosphere when said first and second communication means are in communication with the interior thereof;

whereupon, during inhalation with said piercing means penetrating the capsule, air drawn through said first communication means causes the powdered medicament to be expelled from the medicament-holding capsule through said second communication means and said emptying chamber into the nose, throat or lungs of a user thereof.

4,105,028
POSITIVE CONTROL INTRAVENOUS FLUID ADMINISTRATION

Patricia M. Sadlier, 620 Second St., Brooklyn, N.Y. 11215, and Edward Willett, 44 West End Ave., New York, N.Y. 10024

Filed Oct. 12, 1976, Ser. No. 731,771
Int. Cl.[2] A61M 5/16
U.S. Cl. 128—214 E 15 Claims



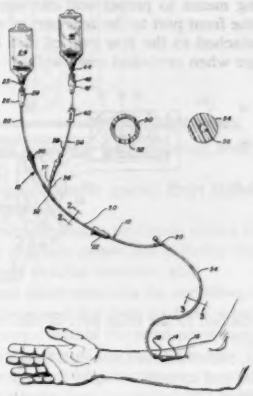
1. In the delivery of fluids parenterally by using an intravenous device which includes a drop former and a fluid conduit connected to the drop former for delivery of fluid from the drop former to a fluid delivery means, the method of controlling the volumetric flow through the fluid conduit comprising the steps of periodically opening the fluid conduit at a frequency equal to a desired rate of drop flow, detecting each drop formed in response to the opening of the fluid conduit, closing the fluid conduit each time a drop is formed and detected, determining the size of formed drops, and varying the time of subsequent openings of the fluid conduit by times relates directly responsive to the size of the formed drops whereby a desired volumetric rate is maintained.

4. In a system for delivery of fluids by means of a flow of drops, apparatus for controlling the rate of flow of the drops comprising, drop forming means for forming drops of the fluid, a fluid conduit having one end connected to said drop forming means for receiving fluid therefrom and another end for delivery of fluid, an electromechanical clamping means on said conduit, said clamping means being in a normally closed position but shifting to an open position in response to the receipt of a signal of a given level, a bistable signal generator means having input means for receiving control signals and output means connected to said electromechanical clamping means for transmitting a signal having other than the given level when in a first state and for transmitting a signal having the given level when in a second state, said input means having means for switching said bistable signal generator means to said first state upon receipt of a first control signal and for switching said bistable signal generator means to said second state upon receipt of a second control signal, source means connected to said input means for periodically generating said first control signals with a repetition rate equal to a desired drop delivery rate, drop detector means for generating one of said second control signals each time a drop is formed and delivered by said drop forming means, indicating means for giving an indication of the size of the drops detected by said drop detector means, and means for controlling the frequency of the generation of said first control signals in accordance with the indications given by said indicating means.

4,105,029
INTRAVENOUS SOLUTION SET HAVING AN AIR ACCESS SITE AND CONSTRICTED INNER DIAMETER PORTION

Robert A. Virag, Lake Zurich, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 602,614, Aug. 7, 1975, Pat. No. 4,034,754. This application Apr. 28, 1977, Ser. No. 791,674
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214 R 4 Claims



1. In a parenteral liquid infusion set which comprises flexible flow tubing, means for connection at one end of said flow tubing with blood vessel penetrating means, means for connection with a parenteral liquid source at the other end of said tubing, drip chamber means having a tubular, drop-forming member at an upper end thereof of reduced inner diameter relative to the inner diameter of said flow tubing, and an intermediately-positioned site providing potential access of air to the interior of said set from the exterior, said site being positioned downstream from said drip chamber, the improvement comprising, in combination: a portion of said flexible fluid flow tubing positioned downstream from said access site defining a bore of reduced diameter, when compared with the bore size of the remainder of said flow tubing, said reduced diameter bore being of a length and diameter to cause the overall frictional pressure drop of water in the portion of said set which is upstream from and including said intermediately-positioned site to be less than the frictional pressure drop of water through the portion of said set which is downstream from said intermediately-positioned site when said set is extended in a fully vertical position, and said means for connection with a parenteral liquid source is connected with a vented solution container in which the liquid level of solution in said container is no higher than the upper end of said means for connection with the parenteral liquid source, and while no outside clamping restriction to flow is applied to said set.

4,105,030
IMPLANT APPARATUS

Josef E. Kercso, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jan. 3, 1977, Ser. No. 756,450
Int. Cl.[2] A61M 5/18
U.S. Cl. 128—217 12 Claims

1. An apparatus suitable for subcutaneously implanting at least one pharmaceutically acceptable pellet in an animal, which apparatus comprises

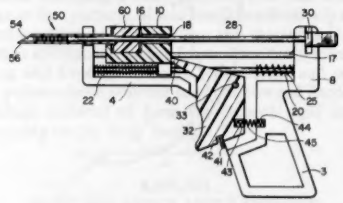
handle means for grasping said apparatus with one hand;

a track attached to said handle means and having front and rear portions, said track being suitable for a carriage to move therealong;

a carriage placed within said track and movable therealong with front and rear portions corresponding to the front and rear portions of said track, said carriage having (i) a means in the front part of said carriage which is adapted to receive and retain a detachable needle having a passageway extending longitudinally through said needle, (ii) a passageway extending the length of said carriage parallel to the length of said track and corresponding to said needle passageway when said needle is received and retained by said carriage, and (iii) means to guide and stabilize said carriage along said track;

propelling means to propel said carriage along said track from the front part to the rear part of said track;

means attached to the rear part of said track to stop said carriage when propelled rearwardly;



means attached to the front part of said track to retain said carriage;

a straight, retractable rod attached to said stopping means so that the rod extends straight through said carriage passageway;

means to retain said rod stationary or allow said rod to be retracted;

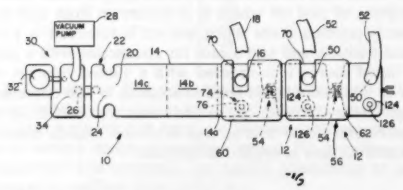
a finger actuatable trigger attached to said handle which is designed to retain said carriage in a cocked position at the front part of said track and when actuated allows said carriage to be propelled rearwardly along said track and rod by force of said propelling means while said handle is held stationary with one hand.

4,105,031

ATTACHABLE EXPANSION CHAMBER FOR PLEURAL DRAINAGE DEVICE

Leonard D. Kurtz, Woodmere, and Robert E. Bidwell, Melville, both of N.Y., assignors to Deknatel, Inc., Long Island, N.Y.

Filed Oct. 10, 1975, Ser. No. 621,591
Int. Cl.² A61M *1/00*
U.S. Cl. 128—276 **26 Claims**



1. An expansion chamber directly mountable on a drainage device for draining fluids from a cavity, the drainage device comprising a container having a collection chamber therein, which included an opening in the upper portion thereof and a puncturable diaphragm sealing said opening, and means for placing the collection chamber in fluid communication with the cavity to be drained, wherein the drainage device is adapted to be connected to a source of suction pressure for maintaining a vacuum on the cavity to be drained and is adapted for collecting liquids in the collection chamber thereof, said expansion chamber providing an additional collection chamber and comprising

a container having an internal collection chamber;

an inlet opening to said internal collection chamber adapted to be placed in fluid communication with the cavity to be drained;

means for removeably rigidly mounting said expansion chamber on the container of the drainage device such that said expansion chamber and drainage device are integral; and

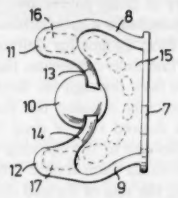
means for substantially equalizing the absolute pressure in said expansion chamber with the absolute pressure in the collection chamber of the drainage device, said equalizing means including an opening in the upper portion of said expansion chamber and means for placing said expansion chamber upper opening in gaseous communication with a portion of said drainage device out of contact with the liquid being collected therein that comprises means for puncturing said diaphragm and an enclosed passageway sealingly connectable between the interior of said drainage device collection chamber through said diaphragm when punctured and said expansion chamber upper opening.

4,105,032

PACIFIER

Hans C. M. Blomstedt, Stockholm, Sweden, assignor to Hans Blomstedt Handelsbolag, Stockholm, Sweden

Filed Oct. 26, 1976, Ser. No. 735,364
Claims priority, application Sweden, Oct. 31, 1975, 7512242
Int. Cl.² A61J *17/00*
U.S. Cl. 128—360 **12 Claims**



1. In an infant pacifier including a shield having a surface, a spherically shaped teat, and means for attaching said teat to said surface of said shield, the improvement wherein said attaching means comprises a pair of legs, each having an end connected to said surface of said shield and extending from said surface generally parallel to each other in spaced relation and elongated arms joined at one end to said teat on opposite sides thereof to extend laterally from said teat and generally perpendicular to said legs and at their other end to the free end of said legs respectively and defining a closed gap with said teat and said shield whose spacing between said legs is of a width so as to be adapted to freely receive all of the incisors of an infant during biting of said pacifier with the portions of said legs adjacent said arms falling in the bite area of an infant's side teeth.

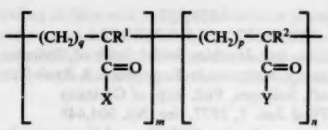
4,105,033

POWDERED GRAFTED CELLULOSE

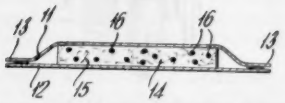
Pronoy Kumar Chatterjee, Spotswood, and Graham Kenneth Morbey, Belle Mead, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 531,149, Dec. 9, 1974, abandoned. This application Mar. 28, 1977, Ser. No. 781,916
Int. Cl.² A61F *13/20*
U.S. Cl. 128—285 **13 Claims**

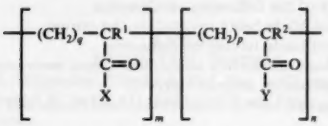
1. An absorbent body comprising cellulose particles having grafted thereon hydrophilic chains of the general formula:



wherein R^1 and R^2 are selected from the group consisting of hydrogen and alkyl having 1 to 4 carbon atoms, X and Y are selected from the group consisting of —OH, —O(alkali metal), and $—NH_2$, wherein m is an integer having a value of 0 to about 5000, n is an integer having a value of 0 to about 5000, the sum of all m and n groups is at least 500, p is an integer having a value of 0 to 1, and q is an integer having a value of 1 to 4; the individual particles of said grafted cellulose having an arithmetic average size of about 70 to about 500 microns; said grafted cellulose comprising from about 5 to about 50% by weight based on the weight of the absorbent body.



5. A catamenial device comprising an absorbent body of cellulose fibers and cellulose particles having grafted thereon hydrophilic chains of the general formula:



where R^1 and R^2 are selected from the group consisting of hydrogen and alkyl having 1 to 4 carbon atoms, X and Y are selected from the group consisting of —OH, —O(alkali metal), and $—NH_2$, wherein m is an integer having a value of 0 to about 5000, n is an integer having a value of 0 to about 5000, the sum of all m and n groups is at least 500, p is an integer having a value of zero to 1, and q is an integer having a value of 1 to 4; the individual particles of said grafted cellulose having an arithmetic average size of about 70 to about 500 microns; said grafted cellulose comprising from about 5 to about 50% by weight based on the weight of the absorbent body.

4,105,034

POLY(ALKYLENE OXALATE) ABSORBABLE COATING FOR SUTURES

Shalaby W. Shalaby, Long Valley, and Dennis D. Jamiolkowski, Paterson, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jun. 10, 1977, Ser. No. 805,501
Int. Cl.[2] A61L *17/00*
U.S. Cl. 128—335.5 **33 Claims**

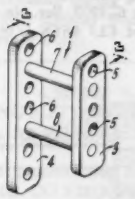
1. A synthetic, multifilament suture having improved tie-down properties, said suture being coated with from about 1 to 15 percent by weight of a composition comprising a poly(alkylene oxalate) wherein the alkylene is C_6 or a mixture of C_4- to C_{12}-alkylene moieties, said poly(alkylene oxalate) having a melting point below about 100° C and an inherent viscosity of from about 0.1 to 1.2 as determined at 25° C on a 0.1 percent solution of polymer in $CHCl_3$ or hexafluoroisopropanol.

4,105,035

NASAL PROSTHESIS

Agnus Rella, c/o Pesce 160-67 23 Ave., Whitestone, N.Y. 11357

Filed Nov. 17, 1976, Ser. No. 742,627
Int. Cl.[2] A61M *29/00*
U.S. Cl. 128—342 **3 Claims**



1. Prosthesis nasal apparatus for alleviating breathing constraints comprising

(a) a pair of elongated phable spaced apart shiftable means relative to each other,

(b) a pair of transverse pliable structural means attached to said elongated shiftable means and shiftable therewith to comprise a single flexible structure, and

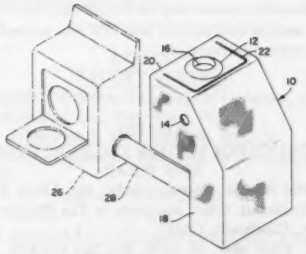
(c) through spaced apart apertures on said elongated structural means for permitting free air flow when the said structure is inserted within the nasal passgeway and also permitting adjustments of the said sides relative to each other over a period of time commensurate with the users capability of withstanding discomfort and need.

4,105,036

PORTABLE SAUNA

Joseph Michael McGrath, 51 Black Rock Pl., Holland, Pa. 18966

Filed Sep. 10, 1976, Ser. No. 722,113
Int. Cl.[2] A61N *33/06*
U.S. Cl. 128—374 **4 Claims**

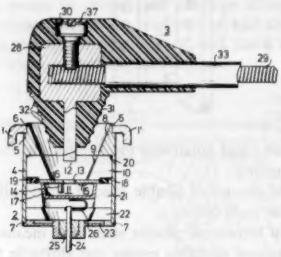


1. A portable sauna comprising a user compartment which is characterized by flexible compartment sidewalls and by the introduction of heat and moisture from an external source into the compartment interior, said compartment being pressurized by the outside source to an inflated condition; said source being clean, moist, heated air, said air being adapted to heat the compartment interior and to inflate the compartment, said external source being a conventional home clothes dryer; and means for connecting a conduit, said conduit leading the air from exteriorly of the compartment to the compartment interior.

4,105,037
RELEASABLE ELECTRICAL CONNECTING MEANS FOR THE ELECTRODE TERMINAL OF AN IMPLANTABLE ARTIFICIAL CARDIAC PACEMAKER

Gerolf Richter, and Scott B. Shanks, both of Berlin, Fed. Rep. of Germany, assignors to Biotronik Mess- und Therapiegerate GmbH & Co., Berlin, Fed. Rep. of Germany

Filed May 6, 1977, Ser. No. 794,659
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 P 27 Claims



1. A releasable connector assembly for use in an implantable cardiac pacemaker system including an electrode, an electrode housing within which one end of the electrode is secured, a pacemaker unit, and a pacemaker housing of electrically conductive material in which the pacemaker unit is secured, said connector assembly comprising: a first member secured to the pacemaker housing and including first electrical connector means arranged to be connected to the pacemaker unit; a second member secured to the electrode housing and including second electrical connector means in conductive contact with the one electrode end and arranged to be placed in conductive contact with said first connector means; one of said members defining a recessed conical surface located between the housing and connector means associated with said one of said members, the other of said members defining a protruding conical surface formed to establish a hermetic sealing connection with said recessed conical surface and located between the housing and connector means associated with said other one of said members, and said one of said members including a body of ceramic material disposed near said connector means associated with said one member and defining part of said recessed conical surface; and securing means associated with said members for releasably connecting them together with said conical surfaces in sealing contact and said first and second connector means in conductive contact.

4,105,038
ACID TREATED POLYETHER POLYURETHANE FOAM END WRAP

David Martin Adrion, Phoenix, Ariz., and Lloyd Bruce Hartsough, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

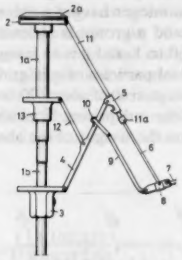
Filed Mar. 26, 1976, Ser. No. 670,940
The portion of the term of this patent subsequent to Aug. 30, 1994, has been disclaimed.
Int. Cl.[2] A45D *7/00*
U.S. Cl. 132—7 9 Claims

1. An end wrap for use in the permanent waving process which comprises a permeable flexible wafer of open-celled polyether polyurethane foam having a thickness of from about 1/16 inch to about 1/64 inch, an average pore incidence within the range of from about 30 to 120 pores per linear inch and, contained in said end wrap, a solid, carboxylic acid having a pK_1 of from about 2.5 to about 6.0, said acid being present at a level of at least 5 milligrams of acid per cubic inch of foam.

4,105,039
SHORTENABLE UMBRELLA

Tilmann Schultes, and Joachim Seidel, both of Solingen, Fed. Rep. of Germany, assignors to Kortenbach & Rauh Kommanditgesellschaft, Solingen, Fed. Rep. of Germany

Filed Jun. 7, 1977, Ser. No. 804,449
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1976, 2626478
Int. Cl.[2] A45B *19/10*
U.S. Cl. 135—25 A 8 Claims



1. A shortenable umbrella having blades carrying the umbrella canopy, the blades being shortenable by telescoping and/or folding, and having a shortenable rod assembly and a crown secured on the shortenable rod assembly and for each innermost blade at least one fork operatively connected by means of at least one slider, the latter displaceably disposed on the shortenable rod assembly, for pivoting the blades, comprising a plurality of the following combination

an innermost blade being pivoted on the crown,

an outermost blade having an extension,

a middle blade operatively connected to said innermost and outermost blades, respectively,

a fork being operatively connected to said blades and to the slider,

a control rod operatively connected to said extension of said outermost blade, said outermost blade being hinged foldably onto said middle blade and actuatable therefor by means of said control rod,

said control rod having an inner end engaging behind said fork with direct contact,

guide member means for guiding said control rod on a limited path along said fork, said inner end of said control rod being articulated on said guide member means.

4,105,040
TEMPERATURE RESPONSIVE VALVE SEAL

Arnold M. Chester, 129 Montclair Dr., West Hartford, Conn. 06107

Filed Jun. 27, 1977, Ser. No. 810,302
Int. Cl.[2] F16K *5/06*
U.S. Cl. 137—72 10 Claims

1. A valve comprising:

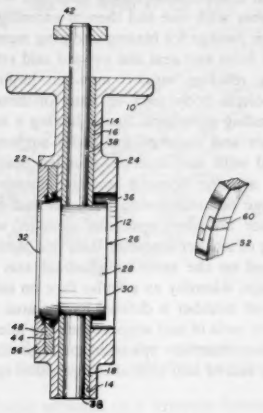
a. a housing including a generally cylindrical flow passage therethrough;

b. a generally disc shaped closure member including an annular peripheral sealing surface, said closure member mounted for rotation in said flow passage between a first position where said flow passage is open and a second position where said flow passage is closed;

c. a first annular sealing member formed from a resilient material and mounted on said housing whereby said first annular sealing member sealingly contacts said peripheral sealing surface of said closure member when said closure member is in said second closed position;

d. a second annular sealing member formed from non-resilient material, said second annular sealing member being mounted on said housing surrounding said peripheral

sealing surface and being expandable in diameter whereby said second annular sealing member seals on said peripheral sealing surface when un-expanded and is spaced from said peripheral sealing surface when expanded; and



e. means holding said second annular sealing member in said expanded condition, said holding means being adapted to permit said second annular sealing member to return to said un-expanded position when a preselected high temperature is reached whereby said second annular sealing member seals against said peripheral sealing surface.

4,105,041

HYDRAULIC SYSTEM

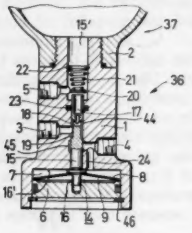
Ludwig Axthammer, Hambach, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Fed. Rep. of Germany

Filed Aug. 3, 1976, Ser. No. 711,153

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1975, 2535221

Int. Cl.² F16K *11/10*

U.S. Cl. 137—116 **11 Claims**



1. A hydraulic system comprising:

(a) a valve casing formed with first, second, and third ports;

(b) a valve member movable in said casing between a first position and a second position,

(1) said valve member and said casing defining a conduit connecting said first and third ports in said first position of said valve member, said valve member closing said conduit in said second position of said valve member;

(c) check valve means connecting said first and second ports in response to fluid pressure in said first port higher than the fluid pressure in said second port while disconnecting said first and second ports when the fluid pressure in said second port is higher than in said first port;

(d) yieldably resilient means permanently biasing said valve member to move from said first to said second position thereof; and

(e) means on said valve member responsive to pressure of fluid in said second port for moving said valve member from said second position toward the first position thereof against the biasing force of said yieldably resilient means,

(1) said force decreasing during a portion of said movement of the valve member from said second position toward said first position.

4,105,042

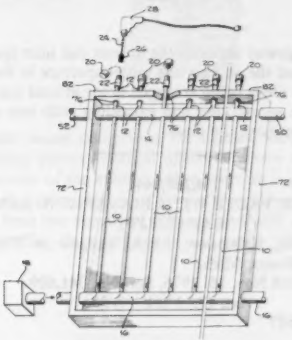
SOLAR HEATING METHOD AND APPARATUS

Franklin K. Johnston, Jr., 118 N. Almansor, Alhambra, Calif. 91801

Filed Mar. 29, 1977, Ser. No. 782,513

Int. Cl.² F28G *3/04*

U.S. Cl. 137—245 **9 Claims**



1. A pipe assembly for a solar heater comprising:

a plurality of longitudinal pipe sections for conducting a fluid, with each of said pipe sections having an opening at the end thereof;

plug means adapted to be fitted through the end of each of said plurality of longitudinal pipe sections for controlling the rate of flow of fluid through the pipe assembly; and

cap means including a plurality of caps each associated with one of said longitudinal pipe sections and secured to the end thereof and removable to enable cleaning of the inside of the associated pipe section.

4,105,043

FAUCET VALVE

Hans Nicolayczik, Minheim, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,174

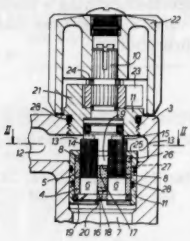
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1976, 2626386

Int. Cl.² F16K *25/00*

U.S. Cl. 137—454.2 **9 Claims**

1. A valve adapted for removable insertion in a valve body used for the control of flow in a plumbing fixture comprising; first and second discs in intimate movable contact with one another along a common interface, the first disc provided with at least one inlet aperture therethrough adapted to be positioned at one end in fluid communication with the inlet channel of a valve body and at the other end adjacent face of the second disc, the second disc having at least one passage aperture therethrough positioned so that relative movement between the discs will direct the apertures therein between the blocked shut-off position with the apertures out of alignment and the partially and completely overlapped positions where fluid can flow through the discs, the discs being mounted in a sleeve and the discs and sleeve being connected to one end of

a spindle, the interconnected discs, sleeve and spindle being removably mounted in a valve body, at least one outlet aperture in the sleeve adapted to be positioned in fluid communication with an outlet on a valve when mounted therein, at least one flow stabilizing insert arranged at a predetermined point in



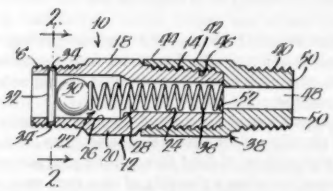
the flow passageway between the at least one inlet aperture in the first disc and the at least one outlet aperture in the sleeve, the at least one insert being arranged in the at least one passage aperture in the second disc and extending with one end near the interface between the discs.

4,105,044

FLOW CHECK VALVE WITH BIAS SPRING REMOVAL CAPABILITY

Joseph J. Davitt, Kalamazoo, Mich., assignor to Ward Aero, Inc., Three Rivers, Mich.

Filed Nov. 15, 1976, Ser. No. 741,609
Int. Cl.[2] F16K *17/28*
U.S. Cl. 137—517 **1 Claim**



1. A flow check valve with on-line in-service inspection capability comprising:

a plug member housing having an orifice for passing forward fluid flow through said valve defined by a peripheral seat in the housing; said housing having a wall means with an exterior surface and an interior surface defining an interior chamber, a cylindrical exterior threaded outlet end, a hexagonal exterior middle portion, and a cylindrical exterior threaded upstream end; said interior chamber having a cylindrical upstream passage on one side of said seat and a cylindrical downstream passage on the other side of said seat and having a larger diameter than said upstream passage; said seat being a frusto-conical portion of said interior surface situated between said cylindrical upstream passage and said cylindrical downstream passage; said wall means having a pair of retaining pin holes on a diameter of said downstream passage, each hole passing through said wall means from said downstream passage radially outwardly to said exterior surface;

a spherical plug member having a diameter less than the diameter of said downstream passage, disposed within said downstream passage, and adapted for sealing against said seat to block said orifice in response to reverse fluid flow through said valve;

a solid cylindrical retaining pin disposed across the diameter of said downstream passage and received at each end within one of said retaining pin holes for retaining said plug member within said downstream passage when the plug member is displaced from said seat in response to said forward flow;

a helical compression spring disposed within said interior chamber with one end thereof extending within said upstream passage for biasing said plug member in a direction away from said seat and toward said retaining pin; and

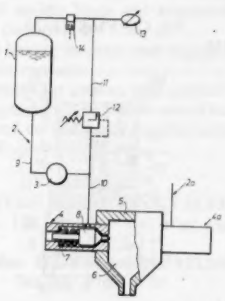
a spring reaction support member, having a substantially cylindrical body with an exterior-threaded inlet end, a depending peripheral flange having a hexagonal exterior surface and a cylindrical inner surface threadingly engaged with said exterior-threaded upstream end of said plug member housing, and an interior cylindrical inlet passage communicating between said inlet end and said interior chamber upstream passage, said inlet passage being of smaller diameter than said upstream passage and aligned on the same longitudinal axis as said upstream passage, whereby an annular face on said spring reaction support member is defined by the area between the concentric ends of said support member inlet passage and said interior chamber upstream passage for supporting the other end of said helical compression spring.

4,105,045

DEVICE FOR MIXING LIQUID REACTION COMPONENTS

Ferdinand Althausen, Neunkirchen, and Reiner Raffel, Siegburg, both of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Germany

Filed Jan. 2, 1976, Ser. No. 646,217
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1975, 2501483
Int. Cl.[2] B29B *1/04*
U.S. Cl. 137—563 **2 Claims**

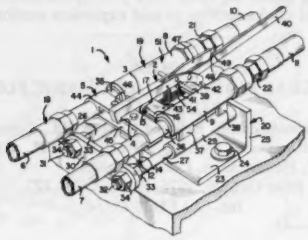


1. In a device for mixing liquid reaction components forming a foam after reaction comprising a storage container for each reaction component, a feed pipe leading from each storage container to a common mixing head where said pipe terminates in a pressure controlled injecting jet which points into a mixing chamber, and a return pipe containing a shut-off valve, said return pipe branching off from the pressure side section of each feed pipe, the return pipe opening out into the respective suction side section of the feed pipe, theimprovement wherein a pressure adjustable initial stress valve whose adjusted initial stress pressure is greater than the solution pressure of the gases or air contained in the reaction components but less than the opening pressure of the injection jet is located in each return pipe.

4,105,046
DETACHABLE FLUID COUPLING

Clifford M. Sturgis, 1213 Westmoreland, Colorado Springs, Colo. 80907

Filed Mar. 31, 1977, Ser. No. 783,494
Int. Cl.[2] F16L *37/12*
U.S. Cl. 137—594 12 Claims



1. A detachable fluid coupling for connecting a source of fluid pressure to a fluid operator, said fluid coupling comprising:

(a) a support frame mounted on a structure having a source of fluid pressure including a plurality of fluid conduits with respective free ends thereof positioned adjacent one end of said support frame;

(b) a plurality of valve members slidably mounted for simultaneous longitudinal movement on said support frame and each having a respective one of the free ends of said fluid conduits connected thereto, said valve members each detachably receiving a respective one of a plurality of fluid conduits of a fluid operator;

(c) a first lever member positioned between said valve members and having one end portion thereof pivotally mounted on at least one of said valve members;

(d) a second lever member having one end portion thereof pivotally connected to said first lever member, said one end portion of said second lever member being spaced from said one end portion of said first lever member, said second lever member having a hook portion on the other end portion thereof;

(e) holding means mounted on the plurality of fluid operator conduits for positioning same to be received in said respective valve members and engageable by said second lever hook portion for retaining said fluid operator conduits in flow permitting position;

(f) a ramp member mounted on another end of said support frame and extending therefrom, said ramp member being positioned between said valve members; and

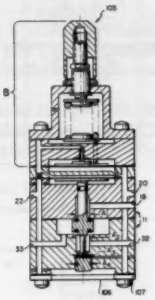
(g) uncoupling means mounted on the plurality of valve members and engageable with said ramp member and said second lever member for moving said hook portion thereof out of engagement with said holding means in response to separation of the fluid operator from the structure having the source of fluid pressure.

4,105,047
VALVE APPARATUS

John J. Smallwood, King, N.C., assignor to Fairchild Industries, Inc., Germantown, Md.

Division of Ser. No. 530,186, Dec. 6, 1974, Pat. No. 4,073,313.
This application Oct. 14, 1977, Ser. No. 842,260
Int. Cl.[2] F16K *11/04*
U.S. Cl. 137—625.6 1 Claim

1. Valve apparatus comprising a valve body, said valve body having an inlet and an exhaust valve aperture and a locking piston isolation aperture, supply valve means including a locking piston member located within said valve body for controlling fluid supplied to said valve body, said supply valve means having manual resetting means for resetting of said supply valve means, means for isolating said locking piston member from the inlet when the exhaust valve aperture is closed, pressure assist means for permitting the pressure of the fluid controlled by said supply valve means to assist in the positive action of said supply valve means and for permitting the pressure of the fluid being controlled to assist in maintaining said supply valve means in the normally open position, said pressure assist means comprising the exhaust valve aperture and the locking piston isolation aperture where the area of the cross section of the exhaust valve aperture is greater than the area of the cross section of the locking piston isolation aperture, at least one signal valve associated with said valve body for controlling the operation of said supply valve means.



4,105,048
HIGH ENERGY LOSS DEVICE

Richard E. Self, Los Alamitos, Calif., assignor to Control Components, Inc., Irvine, Calif.

Division of Ser. No. 611,737, Sep. 9, 1975, Pat. No. 4,068,683.
This application Feb. 3, 1977, Ser. No. 765,171
Int. Cl.[2] F15D *1/02, 1/14*
U.S. Cl. 138—42 2 Claims

1. An exhaust valve for expelling a pressurized high temperature fluid to atmosphere comprising:

a series of elements having adjacent surfaces joined to form a rigid structure;

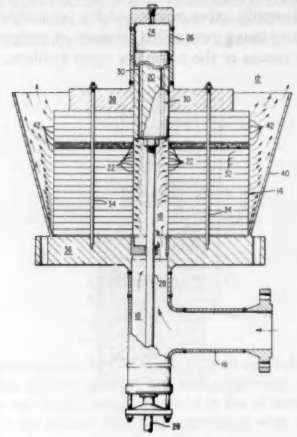
a multi-turn labyrinth formed between the adjacent surfaces of said elements to provide a pressure drop for fluid flowing therethrough;

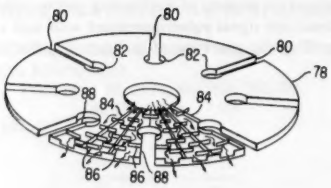
a central aperture extending through said series of elements in a substantially perpendicular manner relative to the adjacent surfaces thereof and providing an inlet to said multi-turn labyrinth therealong;

outlet means formed along the external surface of said rigid structure to exhaust the fluid from said multi-turn labyrinth to the atmosphere; and

stress relief means formed along the external surface of said rigid structure to prevent splitting of said elements of said rigid structure due to a temperature difference between the high temperature fluid at the inlet and the low temperature fluid at the outlet, wherein said stress relief means includes a series of similarly spaced and cut radial cutouts formed in the adjoining surfaces of each of said elements

and wherein each of said elements is oriented to have the radial cutouts of each element aligned to form a series of





cutouts extending vertically through the entire rigid structure.

4,105,049

ABRASIVE RESISTANT CHOKE

Clarence E. Anderson, Edmonton, Canada, assignor to Texaco Exploration Canada Ltd., Calgary, Canada

Filed Dec. 15, 1976, Ser. No. 750,788
Int. Cl.[2] F15D *1/02*
U.S. Cl. 138—44 **6 Claims**

1. A choke assembly for use on producing wells and the like, comprising in combination

a flow straightening section for carrying said producing well effluent, comprising

a constant diameter straight passage therethrough having a length at least ten times said diameter, and

coupling means for the inlet and outlet ends of said straightening section,

a choke section for reducing the pressure of said well effluent, comprising

a predetermined constant diameter passage at the outlet end for providing the desired amount of choking,

a wide mouth tapered passage at the inlet end for gradually reducing said flow straightening section,

said tapered passage having an angle of taper of less than about eight degrees and having a maximum diameter the same as said flow straightening section passage, and

means for cooperating with said outlet end coupling means of said flow straightening section,

and an expansion section for receiving the effluent from said coke section, comprising

a constant diameter conduit having an inside diameter greater than the inside diameter of said flow straightening section, and

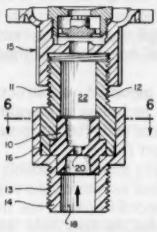
coupling means for removably joining the said outlet end of said choke section to said expansion section.

4,105,050

INTEGRAL FLANGED ELASTOMERIC FLOW RESTRICTOR

Donald W. Hendrickson, Bedford Canyon Rd., Corona, Calif. 91720, and James S. Howard, Riverside, Calif., assignors to Donald W. Hendrickson, Corona, Calif.

Filed Oct. 20, 1976, Ser. No. 734,227
Int. Cl.[2] F16K *15/14*
U.S. Cl. 138—45 **4 Claims**



1. An elastomeric flow restrictor for producing a relatively constant fluid volume flow over a range of input pressure comprising:

an annular main body member having defined through it an annular flow passage orifice;

said main body having annular flanges on the upstream and downstream sides of said orifice for strengthening the region in said main body around said orifice;

the inner diameter of said annular flanges exceeding the diameter of said orifice;

the exterior diameter of said flanges being less than that of the main body for defining shoulders on the main body;

the shoulder on the downstream side being beveled slightly so that the outer perimeter is further downstream than the inner perimeter along said downstream flange; and

said main body and flanges being integrally molded as a single unit from an elastomeric compound, which deforms in response to increased fluid pressure to decrease the size of the passage orifice in response to an increase in fluid pressure by flow of material from said flanges and body member to the means defining the orifice.

4,105,051

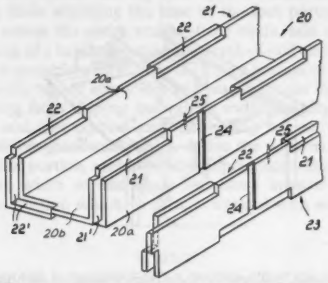
PREFABRICATED COMPOSABLE DUCT ELEMENT

Andrea Visentin, Via IV Novembre 56, Treviso, Italy

Filed Jul. 19, 1976, Ser. No. 706,708
Claims priority, application Italy, Jul. 25, 1975, 82535 A/75
Int. Cl.[2] F16L *9/00*
U.S. Cl. 138—162 **5 Claims**

1. A composable duct element for piping aeriform fluids and for use in erecting concrete casting boxes, comprising two spaced apart facing walls and a wall connecting said facing walls to one another, each of said facing walls having edges including a longitudinal edge and two end edges opposite to one another and at a right angle with respect to said longitudinal edge, and said connecting wall having opposite ends, wherein said edges and said ends have notches and tongues for matching connection with further duct elements, the notches and tongues of said longitudinal edge of said facing walls being

alternately arranged on the inner and on the outer side of facing walls and each of the notches provided on one side of each of said walls defining a corresponding tongue on the other side of the same wall and having a corresponding notch on the other side of the other of said walls, the notches and tongues of each of said opposite ends of said connecting wall being alternate and each having a corresponding notch and



tongue on the opposite end arranged symmetrically opposite with respect to a plane half-way dividing said connecting wall longitudinally, and the notches and tongues of said end edges of said facing walls being consecutive to the respective adjacent notches and tongues of said longitudinal edges of said facing walls and the respective adjacent notches and tongues of said opposite ends of said connecting wall.

4,105,052

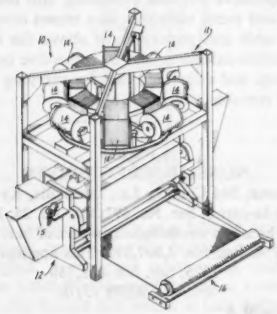
MODULAR CONSTRUCTION FOR TRIAXIAL WEAVING MACHINE

Wayne C. Trost, and Burns Darsie, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Continuation of Ser. No. 670,177, Feb. 24, 1976. This application Dec. 27, 1976, Ser. No. 757,773

Int. Cl.[2] D03D *41/00*

U.S. Cl. 139—101 **14 Claims**



1. A separable modular triaxial weaving machine comprising in selective combination a warp supply module having means for forming a plurality of warp strands into a pair of flat warp sheets moving laterally in opposite directions, and a weaving module having means for forming said oppositely moving warp sheets into sheds, said warp supply and weaving modules being individual independently mounted units, said warp supply module comprising a frame having a plurality of upright legs which straddle the weaving module and are spaced so as to provide an opening which permits movement of the weaving module therebetween, said frame mounting the warp supply above the weaving module, drive means for the weaving module, driven means for the warp supply module, and positive interconnecting means connecting the drive means with the drive means so as to insure synchronism of the operation of the modules.

4,105,053

NOZZLE ASSEMBLY FOR A HYDRAULIC JET LOOM

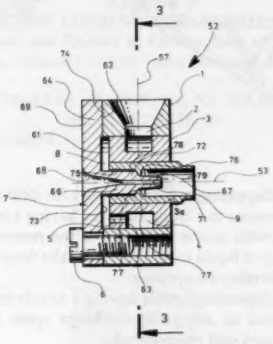
Václav Fajfr, Tyniste nad Orlici, Czechoslovakia, assignor to ELITEX, koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Continuation-in-part of Ser. No. 716,599, Aug. 23, 1976, abandoned. This application Jul. 27, 1977, Ser. No. 819,575

Claims priority, application Czechoslovakia, Oct. 2, 1975, 6664/75

Int. Cl.[2] D03D *47/32*

U.S. Cl. 139—435 **5 Claims**

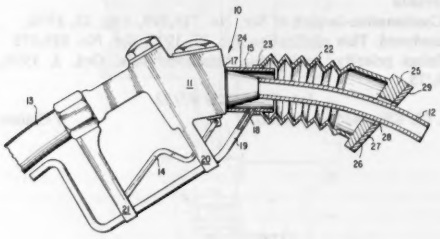


1. In a nozzle assembly for a hydraulic jet loom, an annular housing having front and rear end surfaces transverse to its axis and a radial opening extending through the annular wall of the housing intermediate said front and rear end surfaces thereof for admitting a weft-propelling liquid, an annular insert having a hollow interior, the insert being disposed within the housing coaxially thereof, the insert having a peripheral annular recess confronting and in communication with the radial opening in the housing, a tubular nozzle having a plate-like flange at its forward end, the nozzle having a central passage therethrough adapted for the rearward propulsion of a weft extending axially therethrough, the tubular nozzle extending rearwardly into the hollow interior of the insert coaxially thereof, the radially inner rear surface of the flange and the radially inner front surface of the insert being axially spaced apart and defining between them an annular pressure chamber disposed radially outwardly of the passage in the nozzle, conduit means for selectively connecting the pressure chamber to the rear end portion of the outer peripheral surface of the nozzle to communicate with and to propel rearwardly the weft thread extending through the passage in the nozzle, and valve means interposed in said conduit means selectively closing off and opening said conduit means, the improved arrangement for reducing turbulence in the flow of hydraulic pressure pulses between the radial opening in the housing and the pressure chamber, wherein the nozzle and the insert are so positioned that the pressure chamber is axially aligned with the peripheral recess in the insert, and wherein the conduit means comprises an even number of bores extending axially forwardly through the insert from the front wall of the peripheral recess in the insert to the front surface of the insert to provide fluid communication between the peripheral recess and the pressure chamber, the number of such axial bores being at least equal to 4.

4,105,054
VAPOR SEALING MEANS FOR FUEL DISPENSING NOZZLES

Bernard E. Weidenaar, Harvey, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Continuation of Ser. No. 599,452, Jul. 28, 1975, abandoned, which is a continuation of Ser. No. 473,454, May 28, 1974, abandoned. This application Feb. 11, 1977, Ser. No. 767,709
Int. Cl.² B65B *3/18*
U.S. Cl. 141—311 R **18 Claims**



1. A liquid dispensing nozzle assembly for delivery of liquid from a liquid source to a liquid receiver having a receiver inlet and provided with means to allow for the removal of vapor during delivery of liquid to said receiver inlet from said source, said nozzle assembly comprising:

(1) a liquid dispensing nozzle having a nozzle inlet, a nozzle housing and an elongated discharge spout adapted for insertion into said receiver inlet;

(2) a vapor collector surrounding, in spaced relation thereto and forming a chamber therearound, the upper portion of said spout nearest said nozzle housing, said chamber being in fluid communication with the receiver inlet when said spout is inserted into said liquid receiver, one end of said vapor collector being sealed to said nozzle housing or said nozzle discharge spout, a magnet sealant means carried by the other end of said vapor collector and having an exposed face for forming a surface seal against the outer surface of said receiver inlet, said spout extending beyond the other end of said vapor collector; and

(3) means for allowing removal of vapor from said nozzle assembly; the improvement comprising said magnet sealant means comprising an anisotropic magnet with an exposed face comprising a resilient material selected from the group consisting of leather, polychloroprene, silicone rubber and a compressible cellular plastic material for contacting the receiver inlet, said anisotropic magnet having

(a) a hard continuous medium, and

(b) a strong magnetic attraction for ferrous materials in a direction substantially axially with said spout;

said material having

(a) compressibility of the material in contact with the outer surface of the receiver inlet to allow the anisotropic magnet to urge said face against said receiver inlet when said spout is inserted into and said face contacts said receiver inlet;

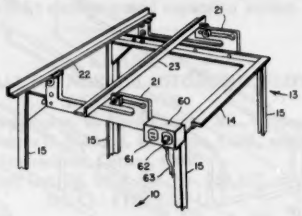
(b) substantial resistance to the liquid dispensed and vapor being removed, and;

(c) the ability to form a seal against the outer surface of said receiver inlet and reduce the amount of vapor escaping to the atmosphere during the liquid dispensing when said spout is inserted into and said exposed face contacts the outer surface of said receiver inlet.

4,105,055
PORTABLE WORKSHOP

Robert Brenta, 36-31 12th St., LongIsland City, N.Y. 11106, assignor to Robert Brenta, Long Island City, N.Y.

Filed Sep. 1, 1976, Ser. No. 719,411
Int. Cl.² B25H *1/04*
U.S. Cl. 144—286 R **4 Claims**

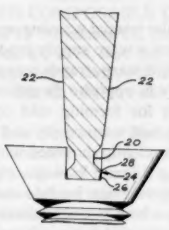


1. A portable, collapsible shop comprising, in combination, a table having a generally rectangular, horizontal frame mounted on vertical legs, a pair of brackets mounted on opposite sides of said frame, a pair of spaced apart rails mounted on said brackets transversely spanning said frame and spaced on top thereof, a plurality of conventional portable power tools including a circular saw, a jig saw, and a router, a wooden table top capable of securely fitting onto said frame, a metal table top capable of securely fitting onto said frame alternatively with said wooden top, said metal table top comprising spaced apart openings, each opening appropriately shaped to accommodate therein the operative portion of a respective one of said circular saw, said jig saw and said router, respective attachment means for said circular saw and router for alternative placement on said rails for slidable travel or rigid securement thereupon and for use in conjunction with said wooden table top, clamping means coupled to said metal table top for respectively securing said circular saw and said router to appropriate positions on the underside of said metal table top with their operative portions extending into their respective openings in said metal table top, arm means coupling said jig saw to said table and positioning it above the table with its operative portion extending into its respective opening in said metal table top, and a carrying case for carrying the tools and parts of said portable collapsible shop.

4,105,056
NONSLIP SCREW DRIVER

Edward T. Arnn, 505 Country La., Louisville, Ky. 40207

Continuation-in-part of Ser. No. 491,361, Jul. 24, 1974, Pat. No. 3,923,088, which is a continuation-in-part of Ser. No. 473,840, May 28, 1974, Pat. No. 3,897,812. This application Oct. 14, 1975, Ser. No. 621,735
Int. Cl.² B25B *15/00*
U.S. Cl. 145—50 A **4 Claims**



1. A screw driver for use in combination with a screw comprising: a shank portion and a blade portion integral therewith,

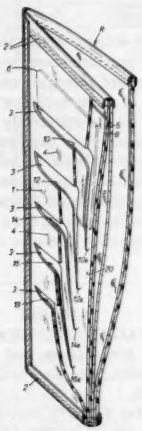
said blade portion terminating at its free end in a foot portion, said foot portion being integral through a smooth transition portion with said blade and being generally pentagon shaped in side cross-section with one side defining a base portion lying in a plane generally perpendicular to the axis of the shank and being engagable with the bottom of a slot having generally parallel sidewalls of a preselected depth in a screw head, said foot portion further having two opposed sides defining upstanding faces adjoining the base of the foot portion and extending across the entire width of the blade, said upstanding faces being of a height less than the depth of said screw slot and thereby engagable with at least the lower portion of said parallel sidewalls of said screw slot to transmit torque thereto, said upstanding faces sloping outwardly and upwardly from the base of said foot portion and terminating respectively at inwardly sloping sidewalls which define the uppermost portion of said foot portion, said inwardly sloping sidewalls extending the entire width of said blade and being integral with said transition portion which, in turn, is integral with said blade.

4,105,057

FLEXIBLE RECEPTACLE WITH CREDIT CARD HOLDER

Terry F. Baumann, Milwaukee, and Gerald W. Brummer, West Bend, both of Wis., assignors to Amity Leather Products Company, West Bend, Wis.

Filed Sep. 23, 1977, Ser. No. 835,890
Int. Cl.² A45C *1/06*
U.S. Cl. 150—35 **1 Claim**



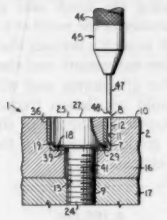
1. A flexible receptacle such as a billfold or the like and including a credit card holder for holding a series of credit cards in shingled, overlapping relationship, said receptacle comprising an outer flexible wall having a series of spaced apart parallel slits therein and which in turn define a series of parallel flaps, said card holder including a flexible liner located against a back-side of said outer flexible wall, said flexible liner having a plurality of pairs of curved slits therein, said pairs of slits being spaced apart from one another in a vertical direction in said liner, the slits of each pair of slits being spaced apart from one another in a lateral direction in said liner and defining a central portion of said liner which is unobstructed and of one-piece construction for the major portion of the height of said liner, the slits of each pair of slits curved inwardly a substantial distance and then downwardly as they approach towards one another and adjacent slits in a vertical direction are sufficiently spaced apart from one another so as to form flexible liner flaps of considerable glue area, said liner slits also having an upper portion which is located closely adjacent the corresponding said slits of said outer flexible wall so as to form a single slit therewith for the insertion of a credit card therethrough, said liner flaps glued adjacent the upper portion of said curved slits to their respective flaps of said outer wall, each of said pairs of slits having lower parallel portions which between them define said central portion, whereby when said card is inserted through the aligned slits of said outer wall and said liner, said cards are supported by said central unobstructed portion of said liner, said parallel portions terminating in lower hooked shaped ends, said hook shaped ends acting to prevent tearing of said liner when a card is inserted in said slits, said liner including a back panel hingedly mounted thereon and inserted in said receptacle and against the said back side of said outer flexible wall for guiding and rigidifying said liner.

4,105,058

SCREW LOCKING ARRANGEMENT

Stuart E. Bunn, and Herbert B. Owsley, both of Shawnee Mission, Kans., assignors to Ball Valve Company, Inc., Merriam, Kans.

Filed Mar. 31, 1977, Ser. No. 783,493
Int. Cl.² F16B *39/00*
U.S. Cl. 151—41.74 **1 Claim**



1. A screw locking arrangement comprising:

(a) an article having a top surface, and an aperture therein with first and second portions; said aperture first portion including an enlarged counterbore defined by a first side wall, and said aperture second portion having an internally threaded second side wall; said first side wall including an open slot therein, said open slot being substantially coplanar with the axis of the aperture and extending from adjacent an inner end of the counterbore through said article top surface;

(b) a screw having a threaded shank and a head with an outer marginal surface and a top surface; said shank being threadedly engaged in said article second side wall, and said head being positioned within said counterbore; said screwhead including an open slot positioned in the marginal surface thereof; said open slot in the screwhead being substantially coplanar with the axis of the screw and extending from adjacent the inner end of the screwhead through said screwhead top surface, said screwhead slot and said article slot being substantially uniform and rectangular in transverse cross-sectional shape; and

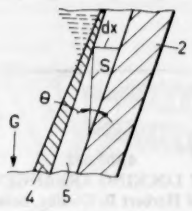
(c) a lock member having a wall with a central aperture through which the screw shank extends, said wall being positioned between the first side wall of said article counterbore and the marginal surface of said screwhead and clamped therebetween with the screw tightened in place; said clamped lock member wall being deformable and bent outwardly into said article slot and inwardly into said screwhead slot thereby positively connecting said screw and said article without indexing the same, and preventing relative rotation therebetween.

4,105,059

METHOD OF REDUCING THE CASTING WIDTH DURING CONTINUOUS CASTING

Masayuki Ohnishi; Hisashi Ohmori, and Yoshiji Yamamoto, all of Kurashiki, Japan, assignors to Kawasaki Seitetsu K.K., Kobe, Japan

Filed Sep. 20, 1977, Ser. No. 834,988
Claims priority, application Japan, Sep. 27, 1976, 51-115536
Int. Cl.[2] B22D *11/04*
U.S. Cl. 164—4 2 Claims



1. In a method of decreasing the width of a continuously cast strand, especially a steel strand, wherein at least one small side of an adjustable, oscillating continuous casting mold is displaced during the casting operation, the improvement which comprises:

intermittently moving the small side of the mold in the direction of the center of the mold at a mean velocity of $v'' \leqq f \times S \times \tan \theta$, in such a manner that there successively follow one another movement- and standstill time sections each amounting to $\frac{1}{f}$ minutes, and wherein;

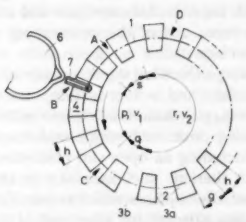
f represents the mold oscillation frequency in cycles per minute, S the double amplitude of the oscillating mold, and θ the taper angle enclosed by the short side of the mold with the vertical.

4,105,060

CHILL CASTING METHOD AND APPARATUS

Wilhelm Hauke, Hilzingen, Germany, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Oct. 27, 1976, Ser. No. 736,139
Claims priority, application Switzerland, Oct. 31, 1975, 14104/75
Int. Cl.[2] B22C *9/20*
U.S. Cl. 164—130 8 Claims



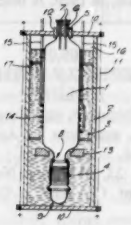
1. A method for chill casting discrete articles by means of a set of individual separable permanent molds each having opposed front and rear joinder faces with a partial mold cavity formed therein, with abutment of the joinder faces of adjacent molds bringing said partial mold cavities together to form a completed discrete mold cavity, said method comprising the steps of individually recirculating said molds about an endless path, moving said molds along a portion of said endless path past a teeming point with part of said molds temporarily formed in a horizontal stack with the rear joinder face of each mold in abutting relationship with the front joinder face of the following mold, and moving said molds to an emptying point where said molds are temporarily accelerated away from said stack, said permanent molds being moved on their respective paths outside said stack with said joinder faces of successive molds kept spaced from each other and each being conducted in the longitudinal direction of said stack when closing up to the respective last mold of the stack.

4,105,061

PRESSURE VESSELS

George Tunnicliffe, Newcastle-under-Lyme, England, assignor to Corning Limited, Sunderland, England

Filed Nov. 24, 1976, Ser. No. 744,853
Claims priority, application United Kingdom, Dec. 1, 1975, 49271/75
Int. Cl.[2] B22C *21/00*
U.S. Cl. 165—1 19 Claims



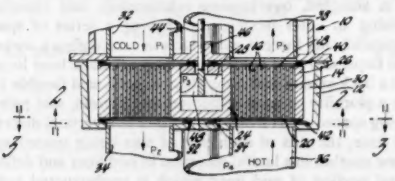
1. A process for storing materials under predetermined positive or negative pressure comprising inserting and sealing within an outer pressure resistant container a fragile storage container incapable of withstanding a pressure differential on opposite sides of its walls respectively greater or less than the said predetermined positive or negative pressure, and substantially filling the interspace between said two containers with a liquid, said fragile container incorporating pressure equalising means whereby the pressure on opposite sides of said fragile container wall is equalised during the creation of said predetermined positive or negative pressure within said fragile container.

4,105,062

TWO-STAGE REGENERATOR SEAL

Albert H. Bell, III, Birmingham, and Richard M. Zeek, Farmington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 13, 1977, Ser. No. 796,688
Int. Cl.[2] F28D *19/00*
U.S. Cl. 165—9 3 Claims



3. In a regenerator assembly of the type having a rotating matrix with axial passages therethrough separated by cell walls, the improvement comprising means including a support platform with opposite faces and having a rim and a cross arm connected at opposite ends thereof to said rim to form a high pressure space and a low pressure space, a seal wear block supported on one face of said platform engageable with said matrix to separate said high pressure space from said low pressure space, a seal assembly surrounding said high pressure

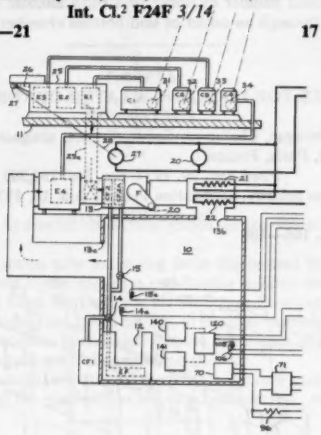
space including a high pressure straight seal leaf supported on said cross arm, said seal leaf including a free end portion directed toward said high pressure space, said high pressure seal assembly further including a plurality of straight rim seal leaf segments formed as chords on the rim of said platform and including fixed ends and free ends directed toward said high pressure space, said lastmentioned free ends having a smaller radius than said fixed ends, means for supporting said rim seal leaf segments on said platform to seal the outer peripheral portion of the high pressure flow path, said straight rim seal leaf segments of said high pressure rim seal being neutrally stressed upon deflection to an installed height to prevent waviness where its free end of a seal leaf is of a smaller radius than its fixed end.

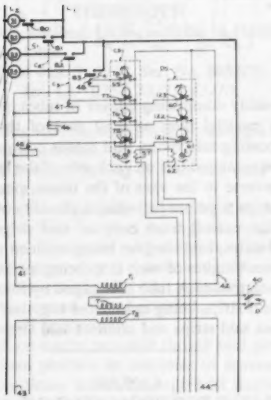
4,105,063

SPACE AIR CONDITIONING CONTROL SYSTEM AND APPARATUS

Carl Bergt, Tyler, Tex., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 27, 1977, Ser. No. 791,364
Int. Cl.[2] F24F *3/14*
U.S. Cl. 165—21 **17 Claims**





1. In a condition control system for ambient air in an enclosed space containing independently cooled moisture condensing surfaces, first switching means operable when energized to cool said air, second switching means operable when energized to heat said air, means responsive to ambient air temperature above a preselected normal range for energizing said first switching means and responsive to ambient air temperature below said range for energizing said second switching means, means responsive to absolute moisture content of said ambient air in excess of a preselected maximum value, and means operable by said moisture content responsive means for energizing said first switching means independently of said air temperature responsive means and without disabling said second switching means.

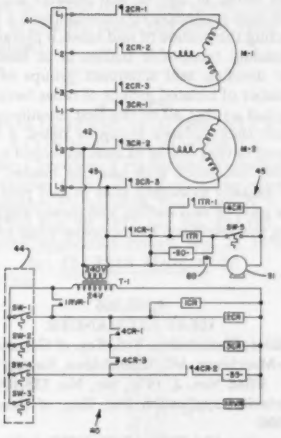
11. The method for maintaining below a predetermined maximum value the dew point temperature of ambient air in a conditioned space provided with heating and cooling apparatus which comprises, cooling said ambient air when dry bulb temperature of said air exceeds a predetermined normal range, heating said air when dry bulb temperature of said air falls below said normal range, cooling said ambient air independently of said dry bulb temperature whenever absolute moisture content of said air exceeds a predetermined maximum value, and reheating said ambient air if said dry bulb temperature falls below said normal range due to cooling in response to excessive absolute moisture content.

4,105,064

TWO STAGE COMPRESSOR HEATING

James J. Del Toro, Liverpool, and Rudy C. Bussjager, Minoa, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,398
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—29 **6 Claims**



1. In a heat pump system having more than one compressor operatively connected to an indoor heat exchanger for providing both heating and cooling within a conditioned region and an outdoor heat exchanger, defrost means arranged to remove ice from the outdoor heat exchanger, and thermostat means in the conditioned region to start the compressors in sequence as the temperature in the conditioned region rises and falls through a series of preset temperature levels, the improvement comprising

a defrost control circuit which, when compressor is energized in the heating mode of operation activates defrost means to initiate a defrost cycle and overrides the thermostat means to effect starting of at least one additional compressor regardless of the temperature within the conditioned region,

first and second contact means in the control circuit which, when enabled, causes the control circuit to be energized,

means to enable said first contact when the first compressor in the sequence is operating, and

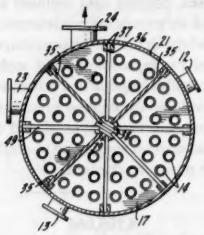
means to enable the second contact when the outdoor heat exchanger is exposed to icing conditions.

4,105,065

HEAT EXCHANGER

Anthony Nicholas Chirico, Short Hills, N.J., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Mar. 7, 1977, Ser. No. 774,841
Int. Cl.[2] F28F *9/02*
U.S. Cl. 165—78 **11 Claims**



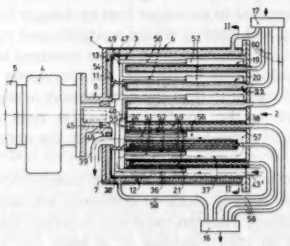
1. A variable pass heat exchanger comprising a a plurality of separated groups of longitudinally extending tubes anchored at each of their ends in separate tube sheets, a header at each end of said exchanger defined in part by one of said tube sheets, an inlet and an outlet in one of said headers for a fluid to be brought into heat exchanger relationship with a heat exchange fluid contacting the outside of said tubes, a plurality of longitudinally extending removable baffles in at least one of said headers for dividing said separated groups of tubes into a variable number of isolated groups of tubes having their openings segregated so that all of the first mentioned fluid passes through each such isolated group of tubes, a longitudinally extending post having one of its ends anchored to the center of the tube sheet associated with said one header, there being a plurality of radially extending slots in said post for receiving one edge of each of said baffles, and means aligned with each of said slots for receiving the opposite edge of each of said baffles.

4,105,066

HEAT EXCHANGER

Gerhard Bühler, Rheinfelden, Fed. Rep. of Germany, assignor to FRYMA-Maschinen AG, Rheinfelden, Switzerland

Filed Nov. 2, 1976, Ser. No. 738,109
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1975, 2549600
Int. Cl.[2] F28F *17/00*; F28G *3/10*
U.S. Cl. 165—94 **8 Claims**



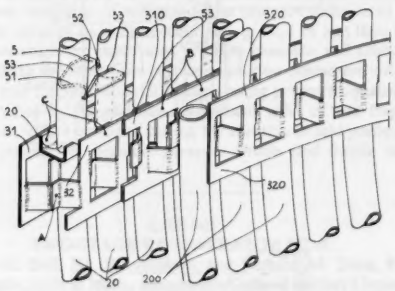
1. A heat exchanger, in particular a scraping cooling arrangement for fluid matter tending to adhere to the heat-exchanging surface comprising: a pot-shaped casing; and end-plate sealing said casing, said casing concentrically interchanging heat-exchanging parts with heat-exchanging agent flowing therethrough; at least three annular chambers for process matter to pass through; a power-driven stripping device having spaced stripping branches protruding axially and unsupported into said annular chambers and having scraper branches fixed and justaposed to the heat exchanger surfaces of said parts, said stripping device being rotatable about the axis of said casing, at least one annular chamber being at one end connected to a nearest outer annular chamber and being connected at the other end to a nearest inner chamber in a circuit, the annular chambers being separated, and a gasket rotating with said stripping device for forming at least one seal; insert means defined by a flanged plate for including cooling elements adapted to be loosely insertable at one end of said casing, said gasket sealing slidingly against said insert means and against the bottom of said casing, said annular chambers being arranged for process matter to flow from an inlet on said casing through one of said annular chambers and then to a bottom chamber in said casing, the process matter flowing from said bottom chamber through a second annular chamber and from said second annular chamber to a third annular chamber for exiting through an outlet of said bottom chamber.

4,105,067

DEVICE FOR LOCATING A LAYER OF TUBES IN AN ENCLOSURE

René Bovagne, Chalon-sur-Saone, France, assignor to Creusot-Loire, Paris, France

Filed Apr. 29, 1977, Ser. No. 792,302
Claims priority, application France, Jun. 16, 1976, 76 18250
Int. Cl.[2] F28F *1/12*
U.S. Cl. 165—159 **8 Claims**



1. An assembly comprising a layer of tubes, said tubes being substantially parallel over at least part of their length and means for locating said tubes, said means comprising a pair of parallel strips arranged one on each side of the layer of tubes in a plane transverse to the axes of the tubes, means connecting said pair of strips together including a plurality of tube-locating tongues which extend from each of said strips towards the other of said strips, said tongues being inclined relative to said strips, adjacent tongues of each strip being inclined in opposite directions such that each tube is engaged by four tongues, said tongues of said strips being connected together to locate said tubes between said strips and connect said strips together.

4,105,068

APPARATUS FOR PRODUCING OIL AND GAS OFFSHORE

William A. Tam, Warrenville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jul. 29, 1977, Ser. No. 820,169
Int. Cl.[2] E21B *33/035*
U.S. Cl. 166—355 **9 Claims**

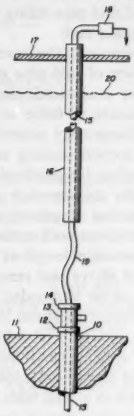
1. Apparatus for producing oil or gas from an offshore oil or

gas well using a production platform near or above sea-level which is laterally and vertically displaceable by the sea and wind and which permits well workover from the production platform, comprising:

a. the following elements of a Christmas tree located at about the seafloor:

a first hydraulic connector joined to the wellhead;

a lower master valve joined to the first hydraulic connector; and



a second hydraulic connector joined to the lower master valve;

b. a production tube extending from the second hydraulic connector to the platform and having a valve means accessible from the platform for oil or gas flow regulation, said production tube having a flexible portion which accommodates lateral and vertical movement of the production tube with the platform, and

c. a production riser around the production tube and extending from the platform to near the seafloor.

4,105,069

GRAVEL PACK LINER ASSEMBLY AND SELECTIVE OPENING SLEEVE POSITIONER ASSEMBLY FOR USE THEREWITH

Eugene E. Baker, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 9, 1977, Ser. No. 805,075

Int. Cl.[2] E21B *33/13, 43/10*

U.S. Cl. 166—51 **10 Claims**

1. An operating tool for selectively actuating a sleeve valve of the type which includes:

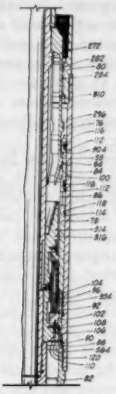
a cylindrical housing having at least one port through the wall thereof; and

a valve sleeve telescopically disposed within said housing and having at least one port through the wall thereof and adapted to communicate with the at least one port of the housing in a first open position and, alternately, sealed from communication with the at least one port of the housing in a second closed position,

said operating tool comprising:

opening position means movable throgh said sleeve valve in the first open position in response to movement of said opening positioner means through said sleeve valve in a first direction, said opening positioner means including at least one outwardly biased arm adapted to selectively engage the valve sleeve of said sleeve valve; and

selective activation means for selectively activating and deactivating said opening positioner means in response to manipulation of said operating too, said selective activation means including arm retractor means adapted to selectively engage said at least one arm for engaging and forcing said at least one arm inwardly against the bias thereof to a deactivated position whereby said opening positioner means can be moved through said sleeve valve in the first direction without placing said sleeve valve in the first open position and, alternately, for disengaging



from said at least one arm and permitting said at least one arm to be moved outwardly in response to the bias thereof to an activated position whereby said opening positioner means can be moved throgh said sleeve valve in the first direction to thereby place said sleeve valve in the first open position.

4,105,070

METHODS FOR DETERMINING THE STUCK POINT OF A CONDUIT IN A BOREHOLE

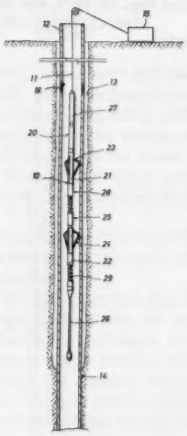
Jean C. Lavigne, Chevreuse; Yves Nicolas, Versailles, and André Landaud, Maisons Alfort, all of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,195

Claims priority, application France, Sep. 28, 1976, 7629054

Int. Cl.[2] E21B *23/04, 47/00*

U.S. Cl. 166—250 **11 Claims**



1. A method for at least approximately locating the lowermost freepoint of a string of pipe disposed in a well bore and comprising the steps of:

moving a deformation-responsive electrical sensor having

first sensing means preferentially responsive to longitudinal deformations of a pipe string and second sensing means preferentially responsive to angular deformations of a pipe string and which is dependently supported by an electrical suspension cable to a selected depth location within said pipe string;

releasably anchoring only the upper end of said sensor to said pipe string at a first wall surface thereof at said selected depth location for providing a temporary support capable of carrying at least some of the weight of said suspended cable so as to avoid imposing downwardly-directed compressional forces on said sensor before its subsequent release from anchoring engagement with said first wall surface;

lowering said suspension cable for resting a slacked lower portion thereof on said upper sensor end so as to avoid imposing upwardly-directed tensional forces on said sensor should said suspension cable be moved upwardly before the subsequent release of said upper sensor end from anchoring engagement with said first wall surface;

only after said slacked portion of said suspension cable is resting on said upper sensor end, releasably anchoring the lower end of said sensor to said pipe string at a lower second wall surface below said selected depth location for enabling said sensor to be responsive to load-induced deformations in the incremental length of said pipe string then situated between said first and second wall surfaces;

monitoring said sensor for simultaneously detecting first and second electrical signals respectively produced by said first and second sensing means in response to induced longitudinal and angular deformations of said incremental length of said pipe string which may occur upon application of force to the surface end of said pipe string; and

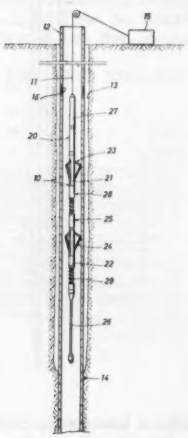
thereafter alternately releasing said upper and lower sensor ends and repeating each of the above-specified steps at different depth locations within said pipe string until one or more electrical signals are produced by said sensor from which at least the approximate depth location of the lowermost freepoint of said pipe string can be determined.

4,105,071

METHODS AND APPARATUS FOR DETERMINING THE STUCK POINT OF A CONDUIT IN A BOREHOLE

Yves Nicolas, Versailles, and André Landaud, Maisons Alfort, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,196
Int. Cl.[2] E21B *47/00*
U.S. Cl. 166—250 **12 Claims**



1. A method for determining at least approximately a remote location at which a string of pipe may be stuck in a well bore and comprising:

moving a deformation-responsive sensor having first sensing means preferentially responsive to longitudinal deformations of a pipe string and second sensing means preferentially responsive to angular deformations of a pipe string to a selected depth location within said pipe string and anchoringly engaging the upper end of said sensor to an upper wall surface of said pipe string which is then adjacent to said upper sensor end;

thereafter anchoringly engaging the lower end of said sensor to a lower wall surface of said pipe string which is then adjacent to said lower sensor end; and

thereafter, upon application of force to the surface end of said pipe string, simultaneously monitoring output signals from said first and second sensing means for detecting whether a corresponding longitudinal deformation and a corresponding angular deformation are then being induced in the incremental length of said pipe string between said upper and lower wall surfaces thereby demonstrating that said incremental length of said pipe string is at least partially situated above said remote location.

6. Apparatus adapted to be suspended from an electrical cable and operated at different locations in a string of pipe to obtain measurements representative of deformations occurring therein in response to the application of forces to its upper end for determining at least the approximate location at which that string of pipe may be stuck in a well bore and comprising:

upper and lower anchoring means including upper and lower wall-engaging members adapted for respectively establishing anchoring engagement with the adjacent spatially-disposed wall surfaces of a pipe string;

control means cooperatively arranged and adapted for selectively operating said upper and lower anchoring means so that said upper wall-engaging members can establish anchoring engagement with the wall of a pipe string before said lower wall-engaging members can establish anchoring engagement therewith; and

sensor means cooperatively arranged between said upper and lower anchoring means and adapted for independently producing first and second output signals which are respectively responsive to longitudinal and angular deformations occurring in an incremental length of a pipe string then situated between such spatially-disposed wall surfaces.

4,105,072

PROCESS FOR RECOVERING CARBONACEOUS VALUES FROM POST IN SITU OIL SHALE RETORTING

Chang Yul Cha, Bakersfield, Calif., assignor to Occidental Oil Shale, Grand Junction, Colo.

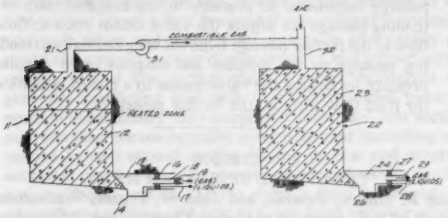
Continuation-in-part of Ser. No. 748,622, Nov. 29, 1976, abandoned, which is a continuation of Ser. No. 652,335, Jan. 26, 1976, abandoned, which is a continuation of Ser. No. 504,028, Sep. 9, 1974, abandoned, and a continuation-in-part of Ser. No. 622,653, Oct. 16, 1975, Pat. No. 4,005,752, which is a continuation of Ser. No. 492,253, Jul. 26, 1974, abandoned. This application Jan. 27, 1977, Ser. No. 763,155
Int. Cl.[2] E21B *43/24, 43/26*
U.S. Cl. 166—261 **45 Claims**

43. A process for recovering post-retorting off gas from an in situ oil shale retort in a subterranean formation containing oil shale, the retort containing a fragmented permeable mass of formation particles containing oil shale comprising the steps of:

establishing a heated zone in a portion of the fragmented mass, the heated zone having a temperature higher than the retorting temperature of oil shale;

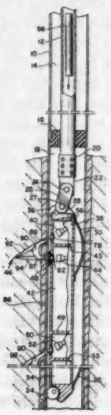
for a period of normal retorting operation introducing an inlet gas to the fragmented mass on a trailing side of the heated zone for advancing the heated zone through the fragmented mass for retorting oil shale to produce liquid and gaseous products and withdrawing such liquid prod-

ucts and off gas including such gaseous products from the in situ retort on an advancing side of the heated zone; and thereafter



for a period of post-retorting operation substantially completely stopping introduction of gas to the in situ retort and withdrawing from the retort a post-retorting off gas comprising gaseous products from retorting oil shale.

4,105,073
TUBING CONVEYED SAND CONSOLIDATING METHOD
Emmet F. Brieger, General Delivery, Nogal, N. Mex. 88341
Filed Sep. 26, 1977, Ser. No. 836,396
Int. Cl.[2] E21B *43/00, 43/117*
U.S. Cl. 166—286 **13 Claims**



8. Jet perforating gun apparatus comprising an elongated main housing having a firing head, a plurality of charge containing chambers spaced from each other by a bulkhead, a shaped charge located in each said chamber, and means connected to each shaped charge and to said firing head for detonating the shaped charges;

adjacent shaped charges being oriented in the same radial direction for perforating a formation with the perforations extending back up into the formation and oriented to extend in close proximity of one another;

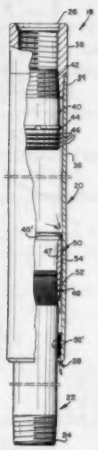
annular seal means positioned on the exterior of the gun in axial alignment with one of the shaped charges such that the plasma jet from a detonated charge extends through the central axis of the annular seal means;

means forcing the main housing laterally against the borehole wall to cause said annular seal means to isolate well fluids from the immediate path of the plasma jet so that when the shaped charges are fired, the chamber adjacent said annular seal means is directly connected to the perforation formed through the borehole wall thereof;

valve means in said bulkhead, said means connected to said shaped charges and to said gun firing head, extends through said valve means; said valve means includes means by which it is moved to the closed position in response to detonation of a shaped charge in one of said chambers;

so that when the charges are detonated, the pressure gradient will force well fluids to flow from the wellbore, into one perforation, out of the other perforation; through the annular seal means and into the chamber adjacent thereto thereby forcing a cavity across the two perforations.

4,105,074
CEMENTING STAGING TOOL
Ernest E. Armstrong, 3521 Seaboard, Midland, Tex. 79701
Filed Aug. 16, 1976, Ser. No. 714,589
Int. Cl.[2] E21B *33/14*
U.S. Cl. 166—317 **18 Claims**



1. A cementing tool which requires no drill-out after staging and which is permanently series connected into a string of casing for cementing the entire casing string within a borehole by flowing cement down the upper casing string, axially through the tool, and down through the lower casing string; and, thereafter down through the upper string, laterally through the tool, and directly into the borehole annulus, comprising:

said tool includes a sub at the upper end thereof for connecting the tool to the lower end of the upper casing string; a barrel affixed to said sub;

a mandrel having a lower end for connecting the tool to the upper end of the lower casing string, the upper marginal end of said mandrel being telescopingly received within said barrel with there being an annulus formed therebetween; means by which the mandrel releasably engages the lower end of the barrel in sealed relation therewith and is captured therewithin so that the mandrel and barrel are always attached to one another;

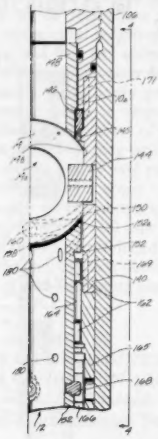
a fluid conducting sealed latch means having one end connected to said sub and another end which can be sealingly connected to said mandrel when the sub is moved towards the mandrel; said sub, barrel, mandrel, and fluid conducting sealed latch means being concentrically arranged respective to one another; whereby,

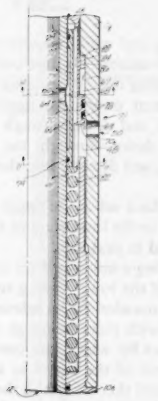
said tool is connected in series relation within a string of casing and lowered into a borehole, cement is pumped through the entire casing string, including the tool, thereby carrying out a first cementing operation, and the upper end of the mandrel is next released from the lower end of the barrel and moved towards the sub to thereby open the annulus between the mandrel and the barrel so that cement can flow laterally away from the tool and into the borehole annulus, and said tool is thereafter again latched together to close the lateral flow path by moving the sub towards the mandrel to cause the sealed latch means to engage one another.

4,105,075
TEST VALVE HAVING AUTOMATIC BYPASS FOR FORMATION PRESSURE

Sydney S. Helmus, London, England, assignor to Baker International Corporation, Orange, Calif.

Filed Jul. 21, 1977, Ser. No. 817,804
Int. Cl.[2] E21B *43/00, 47/00*
U.S. Cl. 166—321 **15 Claims**





1. Well test apparatus having, in a well, an annulus thereabout comprising:

an elongated housing having a fluid passage extending longitudinally therethrough and a fluid passage opening and closing means for such passage;

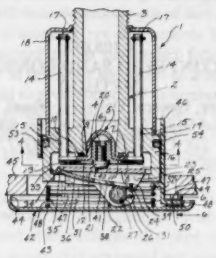
a further fluid passage through the housing to permit fluid flow from the longitudinally extending passage to the annulus; and

differential pressure responsive valve means for the further passage responsive to pressure in the longitudinally extending passage for urging the valve means open to fluid flow in the further passage from the longitudinally extending passage to the annulus and responsive to annulus pressure for urging the valve means to a closed condition for fluid flow through the further passage.

4,105,076
CONCEALED SPRINKLER HEAD

John R. Simons, Delavan, and John W. Fenske, Wauwatosa, both of Wis., assignors to Grunau Company Inc., Milwaukee, Wis.

Filed Nov. 22, 1976, Ser. No. 743,904
Int. Cl.[2] A62C *37/08*
U.S. Cl. 169—40 **25 Claims**



1. A sprinkler head, comprising a body having an inlet to be connected to a water line and having an outlet, internal abutment means disposed in the body and located downstream of the outlet, valve means to close the outlet, a lever assembly engaged with the valve means and disposed to hold the valve means in a closed position, said lever assembly including a first lever member engaged with said valve means and having one end engaged with said abutment means, temperature responsive release means carried by said first lever member and including a fusible element adapted to melt at an elevated temperature, and a second lever member having one end engaged with said abutment means and having the opposite end portion engaged with said release means, the opposite end of said first lever member being engaged with said second lever member at a location between the ends of said second lever member, manually adjustable means engaged with said first lever member for exerting a force through said second lever member on said release means in a direction to urge said release means out of engagement with said first lever member, melting of said fusible element enabling said second lever member to release the release means from engagement with said first lever member and thereby open said valve means.

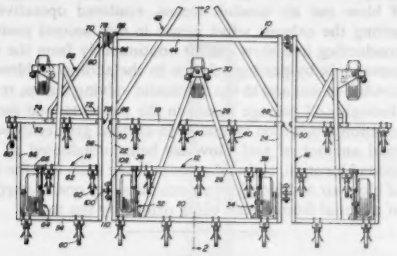
4,105,077
UNIVERSALLY SUPPORTED IMPLEMENT FRAME SECTION

Edwin A. Seifert, Jr., Rte. 1, Box 22, Belgrade, Mont. 59714

Continuation-in-part of Ser. No. 632,687, Nov. 17, 1975, abandoned, Continuation-in-part of Ser. No. 477,320, Jun. 6, 1974, abandoned, Continuation-in-part of Ser. No. 268,782, Jul. 3, 1972, abandoned. This application Dec. 6, 1976, Ser. No. 747,593
Int. Cl.[2] A01B *73/00*
U.S. Cl. 172—311 **8 Claims**

1. A ground working implement defining an intended forward path of movement and including first and second horizontal frame sections arranged in side-by-side relation to said path, said sections each including ground working elements and ground engaging support wheel means, said first section

including means for coupling to a prime mover, and coupling means coupling said sections together for transferring forward thrust from said first section to the second section, limited angular displacement of said second section relative to said first section about a first horizontal axis generally normal to said path when said sections are generally horizontally disposed and upward angular displacement of said second section relative to said first section about a second horizontal axis generally paralleling said path to a raised folded transport position substantially fully supported from said first section, said coupling means includes a front to rear extending arm carried by said second section having its rear end pivotally anchored to a forward portion of said second section for limited oscillation relative thereto about a third horizontal axis generally paralleling said first axis and front and rear aligned coupling structures defining said second axis and between



which the latter extends, coupling the front end of said arm to a forward portion of said first section and the rear portion of said second section to a rear portion of said first section for oscillation of said arm and second section about said second axis relative to said forward and rearward portions, respectively, of said first section, said coupling structures including means operative to allow limited angular displacement of the front end of said arm relative to said first section about a fourth horizontal axis disposed generally normal to said path and limited angular displacement of the rear portion of said second section relative to said rear portion of said first section about said first axis, said rear coupling structure including means operative to allow limited front to rear shifting of said first axis relative to said first section and said front coupling structure including means for transferring forward thrust from said first section to said arm means.

4,105,078

MOTOR GRADER BLADE SUPPORT WITH SELF-RETAINING WEAR STRIPS

Russell L. Gilbert, Kingsland, Tex., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 1, 1976, Ser. No. 746,569

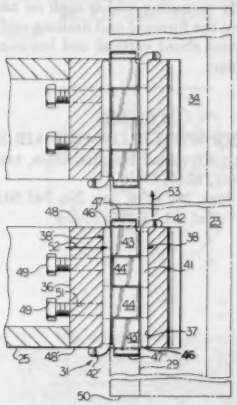
Int. Cl.[2] E02F *3/76*

U.S. Cl. 172—781 **14 Claims**

1. Mounting structure for attaching a blade to a grader wherein said blade has a linear slide rail secured thereto which is engaged by said mounting structure to enable sideward sliding movement of the blade relative to the mounting structure, comprising:

a bracket forming a part of said mounting structure and having opposite outwardly facing side surfaces facing away from each other and connected by a slot for receiving an edge portion of said rail,

a pair of self-retaining wear strip members disposed in said slot of said bracket, each of said wear strip members having a main body extending along said slot and further having as a fixed component element thereon a retainer portion at one end only which is angled away from said main body and said slot to extend along and abut a separate one of said opposite outwardly facing side surfaces of said bracket than that abutted by the retainer portion of the other wear strip thereby blocking movement of a first of said wear strip members along said slot in one direction and blocking movement of the second of said wear strip members in the opposite direction, said wear strip members further having abutted portions which block indepen-



dent movement along said slot of one wear strip member relative to the other thereby causing said wear strips jointly to be blocked from longitudinal movement in either direction along said slot.

4,105,079

DEVICE FOR LAUNCHING PERCUSSION GROUND BORERS

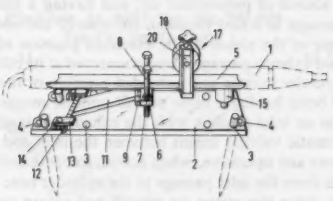
Paul Schmidt, Reiherstrasse, Lennestadt-Saalhausen, Fed. Rep. of Germany (5940)

Filed Feb. 8, 1978, Ser. No. 766,738

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1976, 2605010

Int. Cl.[2] E21C *5/00*

U.S. Cl. 173—42 **16 Claims**



1. A launching device for launching a percussion borer at the start of a ground boring operation, said device comprising a carrier for holding said borer, mounting means for mounting said borer on said carrier, said mounting means being adapted to permit forward movement of said borer relative to said carrier but to resist backward movement of said borer relative to said carrier, means for anchoring said carrier to said ground whereby backward impulses on said borer resulting from percussive operation of said borer are transmitted through said carrier and are counteracted by reaction forces from said ground, said carrier comprises a trough for receiving said borer, said trough having a forward end and a rearward end so that the forward movement of the borer is in the direction from the rearward end toward the forward end of said trough, a base plate adapted to be anchored to said ground, and means for adjustably supporting said trough from said base plate, said mounting means including braking means for braking movement of said borer relative to said trough to permit said forward movement but resist said backward movement to said

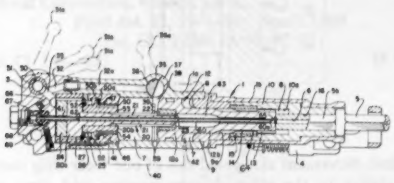
borer in said trough, said means for supporting said trough from said base plate includes angular adjusting means whereby said trough is angularly adjustable relative to said base plate in vertical and horizontal directions, and means adjacent the forward end of said trough forwardly of said angular adjusting means for pivotally mounting said trough on said base plate, said means adjacent the forward end limiting said forward end to angular movement about vertical and horizontal axes relative to said base plate.

4,105,080

AIR HAMMER WITH BLOW-OUT AIR SYSTEM

Samuel D. Gunning, Cleveland Heights, Ohio, assignor to Kent Air Tool Company, Kent, Ohio

Filed Nov. 29, 1976, Ser. No. 745,801
Int. Cl.[2] B25D *17/14*
U.S. Cl. 173—66 **3 Claims**



1. In a reciprocating air hammer,

an elongated body having a front end and a rear end, and power cylinder bore;

a power piston reciprocable in the cylinder bore from a retracted starting position to an extended power delivery position, and return;

tool supporting means at the front end of the body for holding a tool for axial reciprocation in coaxial relation to said bore and in position to be struck by the piston on the power delivery stroke;

said body, at its rear end, having an air inlet passage connected to the cylinder bore and adapted for connection to a source of pressurized air, and having a lateral exhaust passage at a first location, endwise of the body, near the rear of the piston in the extended position of the piston, said exhaust passage being connected at its inlet end to the cylinder bore in said extended position of the piston;

said body having a blow out air conduit means connecting the air inlet passage with the exhaust passage;

automatic valving means between the inlet and rear of said bore and operative, when active, to cause delivery of live air from the inlet passage to the cylinder bore in a manner to drive the piston on power and return strokes, alternately in succession;

an inlet valve at the rear of the body for admitting and cutting off the delivery of live air to the inlet passage;

a settable exhaust valve separate from, and settable independently of, said inlet valve, and connected to said blow out air conduit means and said exhaust passage, and settable, selectively, in a first position in which it connects the exhaust passage to the atmosphere, and in a second position in which it disconnects the exhaust passage from the atmosphere and concurrently connects it to the blow out air conduit means;

means rendered operative by setting the exhaust valve in said first position to render the automatic valving means active;

means rendered operative by setting the exhaust valve in said second position to render the automatic valving means inactive and thereby to discontinue reciprocation of the piston while continuing to admit live air to the rear of the cylinder bore, and to connect said blow out air conduit means to the cylinder bore at said first location, and thereby to deliver a flow of blow air through the automatic valve and, concurrently, a direct flow of blow out air into the power cylinder bore at first said location;

one blow air conduit means, including passage means extending through the piston from one end to the other, operative during operation of the piston, to conduct the limited air of that live air, admitted by the automatic valve to the cylinder bore, to a second location from which it can flow freely to the tool during operation of the piston in extended position of the piston;

additional blow air conduit means, extending part way through said passage means in the piston and operative, in all positions of the exhaust valve means, for conducting an additional limited flow of blow air continuously from the inlet passage to said second location in by-passing relation to, and independently of, the automatic valve means, the total of said blow air being insufficient to blow particles out of the hole being drilled; and

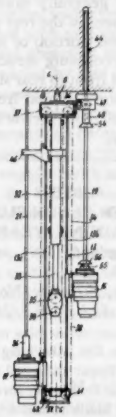
said blow out air conduit means, rendered operative by setting the exhaust valve means in said second position, conducting live blow out air continuously from the inlet passage, in by-passing relation to the additional blow air conduit means and to the automatic valving means, to and through said passage means in the piston to said second location in addition to, and in an amount greater than, the total amount of said blow air being conducted to said second location, and said amount being such that the total of blow air and blow out air can blow out coarse particles of material from a hole being drilled by the tool.

4,105,081

ROCK-DRILLING AND BOLT-SETTING APPARATUS

Raymond Jean Perraud, Villeurbanne, France, assignor to Societe d'Etude et de Construction de Machines pour Toutes Industries S.E.C.O.M.A.S.A., Villeurbanne, France

Filed Dec. 28, 1976, Ser. No. 754,990
Claims priority, application France, Dec. 30, 1975, 75 40426
Int. Cl.[2] E21B *9/24*
U.S. Cl. 175—122 **5 Claims**



1. A rock-drilling and bolting apparatus comprising a slide upon which can slide a first carriage for drilling a hole and a second carriage for inserting and locking a bolt in said hole, the slide being capable of pivoting around and sliding on an anchored rod so that in one position the longitudinal axis of the bolt is substantially aligned with the axis of the drilled hole, a drilling device which is coaxial with the drill bit of the first carriage and which can be used at the end of the drilling operation to widen conically the entrance of the drilled hole to facilitate the positioning of the bolt, said drilling device comprising an opening bit located around and able to rotate and move longitudinally in respect of the drill bit, and capable of

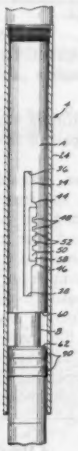
being driven round and thrust forward at the same time as the bit when the first carriage comes to the end of its travel, said drilling device being carried by a stop upon which rests a collar fixed to the bit until the drilling carriage comes to the end of its travel, the bit also having opposed coupling devices which operate together when the first carriage nears the end of its travel, the coupling devices comprising a friction clutch.

4,105,082

JARRING TOOL

Alton E. Cheek, 1949 Vuelta Grande Ave., Long Beach, Calif. 90815

Continuation of Ser. No. 638,437, Dec. 8, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,713
Int. Cl.[2] E21B *1/10*
U.S. Cl. 175—302 **15 Claims**



1. An elongated jarring tool adapted for producing jarring impacts in both longitudinal directions comprising:

a tubular section,

a stem section positioned for relative longitudinal movement with respect to said tubular section between first and second jarring positions,

a first pair of opposed shoulder means on the respective said sections engageable to define said first jarring position and a second pair of opposed shoulder means on the respective said sections engageable to define said second jarring position,

said tubular section having a longitudinal slot in a wall thereof, and said stem section having a lug member thereon projecting within said slot, said lug member being shorter than said slot in the longitudinal direction to enable relative longitudinal movement of said sections between said jarring positions,

first teeth means on said tubular section adjacent said slot and second teeth means on said lug member, said first and second teeth means being meshable with each other and being tapered so that longitudinal force in either direction between said section will tend to cam said first and second teeth means rotationally apart toward disengagement to initiate a jarring action,

locating means on said sections longitudinally locating said sections relative to each other at a position intermediate said jarring positions when said first and second teeth means are in their meshed position, and

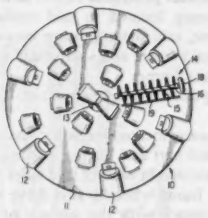
an elongated torque means connected at one end to said stem section for rotationally biasing said first and second teeth means toward their meshed position, and clamping means for connecting the other end of said torque means in a fixed rotational position relative to said tubular section.

4,105,083

LARGE DIAMETER DRILL BIT

James H. Allen, Lakewood, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jun. 9, 1977, Ser. No. 804,881
Int. Cl.[2] E21C *13/02*
U.S. Cl. 175—313 **15 Claims**



1. A rotary drill bit, adapted for connection with a drill column, for drilling large diameter shafts in the earth comprising;

a main bit body having a face across which drilling fluid is adapted to flow and a central opening adapted for communication with the interior of the drill column for enabling drilling fluid to pass therethrough;

a plurality of cutters mounted on the face of said main bit body forming a cutting plane for contacting and disintegrating the earth formation at the shaft bottom; and

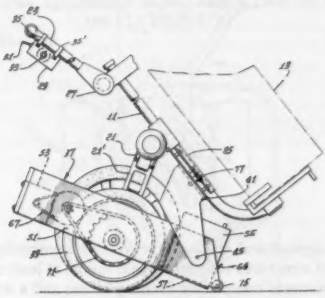
means radially positioned on the face of said main bit body for enhancing the flow of drilling fluid across the face of said main bit body, said flow enhancing means includes an axial flow impeller rotating about an axis positioned on the radius of said main bit body.

4,105,084

POWER UNIT FOR GOLF CART AND THE LIKE

Albert E. Baak, 1650 San Pablo Dr., Lake San Marcos, Calif. 92069

Filed Apr. 14, 1977, Ser. No. 787,609
Int. Cl.[2] B62D *51/04*
U.S. Cl. 180—11 **10 Claims**



5. A power unit to supply powered movement to a cart of the type having a frame and a pair of spaced and aligned support wheels, including in combination:

a manually operated control unit having switching means and a battery;

an electric motor having a drive shaft output;

a drive wheel adapted to be impelled by said dirve shaft output;

said drive shaft output of said electric motor being responsive to said manually operated control unit;

means for positioning said drive wheel intermediate and

spaced from said support wheels so that the point of contact of said drive wheel with the ground is aligned with the points of contact of said support wheels with the ground;

a power frame having a forward section, a trailing section, a top edge and a bottom edge;

said drive wheel having a wheel shaft fixed to said drive wheel and rotatably mounted on said power frame so that said drive wheel protrudes below said power frame;

said motor being located in said trailing section of said power frame, said battery being located in said forward section of said frame and said wheel shaft being attached to said power frame;

a yoke having a cross-member and two approximately parallel sides,

attachment means located on said cross-member for fixedly engaging said cart and having a pair of knobs, and

pivot means located in each of said sides to pivotally engage said power frame whereby said drive wheel is enabled to maintain contact with the surface of travel throughout changes in the terrain; and

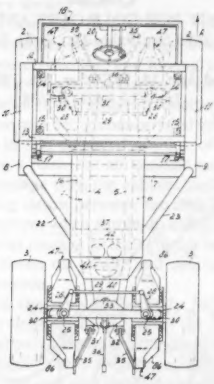
a bracket mounted on the elongated portion of said cart, said bracket having a pair of slots therein spaced apart an amount equal to the spacing of said knobs whereby said knobs and said brackets form a quick connect joint for the engagement of the cart and the unit to supply powered movement at the power frame.

4,105,085

TRACTORS AND OTHER VEHICLES

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 517,068, Oct. 22, 1974, abandoned.
This application Nov. 26, 1976, Ser. No. 745,204
Claims priority, application Netherlands, Oct. 22, 1973, 7314474
Int. Cl.[2] B60J *17/30, 17/34*
U.S. Cl. 180—43 R **20 Claims**



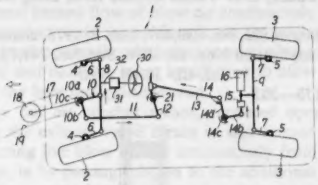
1. An agricultural tractor type vehicle comprising a frame and wheel structures supporting said frame, at least one of said wheel structures comprising housing means and a wheel rotatably mounted on said housing means, said one wheel structure being connected to said frame by an elongated upwardly extending pivot pin held in a sleeve assembly, a lower portion of said sleeve assembly being fixed to said housing means and a further portion of said sleeve assembly caused by the weight of said frame to abut and adjoin said lower portion at supporting interfaces, said pin being nonrotatably received in the lower portion, said further portion being fastened to said frame, said one wheel structure and lower portion upon the relative raising of said frame only being movable relative to said frame and said pin in a downward direction along the longitudinal axis of said pin and separable from the remainder of the vehicle.

4,105,086

SYSTEM FOR CONTROLLING VEHICULAR FOUR-WHEEL STEERING MECHANISMS

Takemochi Ishii, No.3-11-12, Kugayama, Suginami-ku, Tokyo; Masakazu Iguchi, No.8-1-1, Nishishinjuku, Shinjuku-ku, Tokyo, and Masaki Koshi, No.1-1-26-524, Nakameguro, Meguro-ku, Tokyo, all of Japan

Filed Nov. 11, 1976, Ser. No. 740,882
Claims priority, application Japan, Nov. 13, 1975, 50-136687
Int. Cl.[2] B62D *7/00*
U.S. Cl. 180—79 **8 Claims**



1. A system for controlling four-wheel steering mechanisms for vehicles having a pair of front wheels and a pair of rear wheels, comprising:

a steering mechanism operable in response to a steering operation to turn the front and rear wheels to angles suitable for directing the vehicle to a steered direction, including front and rear steering linkages operatively connected respectively to the front and rear wheels; and

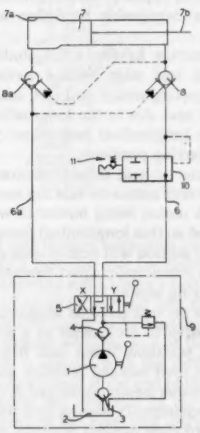
control means interconnecting said front and rear steering linkages and responsive to the speed of the vehicle to vary the ratio of the steering angle of the rear wheels to the steering angle of the front wheels as a function of the travelling speed of said vehicle to effect four-wheel steering in low-speed operations, and to vary only front steering in high-speed operations of said vehicle.

4,105,087

HYDRAULIC CAB TILTING SYSTEMS

Henry John Levington, Snelland, England, assignor to Clayton Dewandre Company Limited, Titanic Works, England

Filed Apr. 4, 1977, Ser. No. 784,465
Claims priority, application United Kingdom, May 3, 1976, 17933/76
Int. Cl.[2] B62D *23/00*
U.S. Cl. 180—89.15 **3 Claims**



1. In a hydraulic ram system for tilting the cab of a commer-

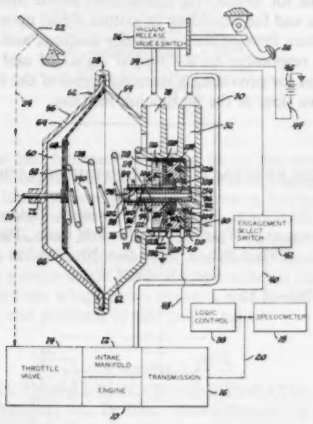
cial vehicle, which cab is resiliently mounted on the vehicle frame or chassis, and wherein the end of the ram cylinder in which the ram piston is located when the cab is in the lowered position is of increased bore diameter to provide enough clearance around the piston to render the ram passive in this position, the length of the increased cylinder bore being sufficient to accommodate the maximum movement of the cab on its suspension, the improvement wherein there is provided in the line to the upper end of the ram cylinder an auxiliary valve which is adapted to be held by a spring-loaded detent in the closed position and the arrangement being such that when a predetermind pressure is reached in the upper end of the ram cylinder during a cab lifting operation and occasioned by the entry of the ram piston into the smaller diameter end of said cylinder, said pressure acting on the valve overcomes the spring-loading on the detent and moves the valve to the open position.

4,105,088

SERVOMOTOR WITH POSITION FEEDBACK

Wayne A. Levijoki, Clio, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 7, 1977, Ser. No. 774,925
Int. Cl.[2] B60K *31/00*
U.S. Cl. 180—108 **4 Claims**



1. In a differential pressure operated servomotor comprising:

a housing having a fixed wall and a power wall cooperating therewith to define a variable pressure control chamber on one side of said power wall, the other side of said power wall being exposed to atmospheric pressure, a valve assembly having an atmospheric pressure inlet port, a subatmospheric pressure port adapted to be connected to a source of subatmospheric pressure, a valve member having a movable control port normally connecting said variable pressure chamber with said atmospheric inlet port, said valve member being movable toward said power wall to progressively close said atmospheric inlet port to achieve a poised condition and being further movable to progressively open said subatmospheric pressure port by said movable control port,

a position feedback spring acting between said power wall and said valve member to increase the spring force in inverse relationship to the distance between said power wall and said valve member,

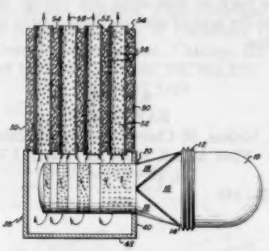
and means mounted on said housing fixed wall and selectively urging said valve member against the force of said feedback spring in accordance with power wall position demand and position error and, when so urging doing so with a force which decreases inversely with the distance said valve member moves away from said housing fixed wall toward said power wall.

4,105,089

FLOW DISTRIBUTOR FOR GAS TURBINE SILENCERS

Frederick V. H. Judd, 4876 Victor St., Jacksonville, Fla. 32207

Filed Nov. 24, 1975, Ser. No. 634,848
Int. Cl.[2] F01N *1/08, 1/10*
U.S. Cl. 181—264 **11 Claims**



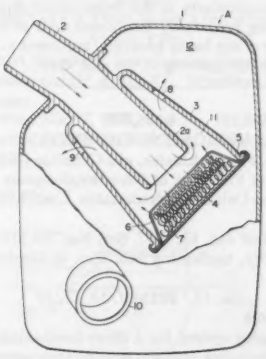
1. A gas flow distributor for exhaust gas emitted from a gas turbine comprising an elongated chamber, closed by walls on all sides and one end, having an open inlet for connecting to a gas turbine exhaust, said chamber being sized to accommodate a turbulently noisy flowing stream of combustion gas exhausted from said turbine, means for solidly coupling the open end of said flow distributor chamber to the exhaust emitted from said turbine, perforations passing through and disposed in bands about the walls of said flow distributor in number, size and spacing graduated from lower to greater gas flow restriction from said open end inlet to the lateral perforations outlets to emit the gas stream passing through said flow distributor in substantially even radial non-turbulent flow therefrom, and shielding means deflecting the exhausted gas stream emitted by said flow distributor in radial direction.

4,105,090

MUFFLER FOR EXHAUST GASES

Histaro Tachibana; Hisashi Fujii, and Tamotsu Sezaki, all of Akashi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Aug. 9, 1976, Ser. No. 712,573
Claims priority, appreciation Japan, Aug. 9, 1975, 50-110028
Int. Cl.[2] F01N *7/10*
U.S. Cl. 181—265 **5 Claims**



1. An exhaust gas muffler of the type having a muffler casing with an exhaust port, and an exhaust gas inlet pipe for passing exhaust gas from an engine into said muffler casing, the improvement characterized by:

a small size casing attached to and surrounding the exhaust portion of said inlet pipe within said muffler casing, said small size casing having a cross sectional area which increases progressively from the point of attachment to a termination thereof downstream of the tip of said inlet pipe, an end plate having a sound absorbing material connected therewith positioned to close the termination end of said small size casing so that said sound absorbing material faces the output tip of said inlet pipe to receive exhaust gases as they exit said inlet pipe and make a turn to flow back up said small size casing, and nozzles provided in the wall of said small size casing surrounding said inlet pipe.

4,105,091

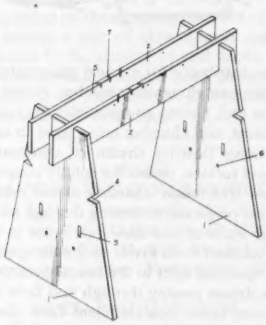
SAWHORSE

Philip J. C. Mahan, 60 Cherokee Hills, Tuscaloosa, Ala. 35401

Filed Aug. 5, 1976, Ser. No. 711,701

Int. Cl.[2] F16M *11/00*

U.S. Cl. 182—181 **1 Claim**



1. A saw horse comprising two essentially vertical, trapezoidally shaped plate-type legs, connected to two parallel horizontal backs, spaced substantially apart, said connection being accomplished by opposing matched notches on said legs and backs, said notches being of sufficient depth to provide stability in the longitudinal direction of the backs and to provide a fixed dimension between the backs for the insertion of lumber and to provide a vertical space between the top surface of the back and the top edge of the legs, said backs having kerfs cut at commonly used angles in construction at the same depth as that existing between the tops of the backs and legs, and having holes cut perpendicularly to the longitudinal direction of the backs supporting removably positioned nails at a depth from the top surface of the backs generally sufficient to enclose and support lumber for mitering in the said kerfs.

4,105,092

LUBRICATING OIL SYSTEM

Günter Zeidler, Friedrichshafen, and Christian Günther, Bermatingen, both of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Jan. 13, 1977, Ser. No. 759,173

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1976, 2601133

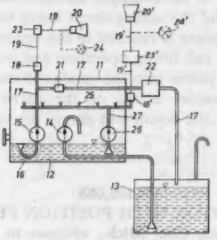
Int. Cl.[2] F01M *1/18, 11/10*

U.S. Cl. 184—6.4 **24 Claims**

1. A lubricating system for a drive mechanism, the system including a lubricating medium storage tank means and an oil reservoir means arranged at the drive mechanism for accommodating a predetermined quantity of lubricating medium, the improvement comprising:

a first pump means arranged at the drive mechanism and operatively connected with the storage tank means and the reservoir means for constantly replenishing the oil reservoir means with a supply of lubricating medium to maintain the predetermined quantity therein during an operation of the drive mechanism,

a second pump means arranged at the drive mechanism having a higher conveying power than said first pump means and operatively connected to the oil reservoir means and the storage tank means for conveying excess



lubricating medium from the reservoir means to the storage tank means,

means arranged in a delivery conduit of said second pump means for monitoring a condition of the lubricating medium and for providing an output signal upon a failure in a return flow of the lubricating medium, and

means responsive to the output signal of said monitoring means for providing a warning signal of the failure in the return flow of the lubricating medium.

4,105,093

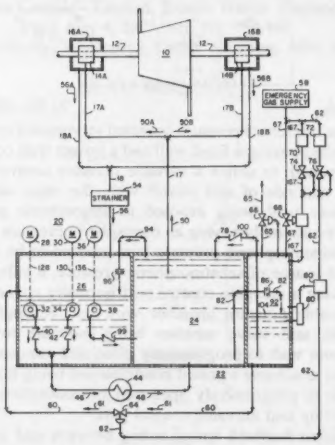
CONTROL SYSTEM FOR PRESSURIZED LUBRICATING SYSTEM

John D. Dickinson, Springfield Township, Delaware County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 3, 1977, Ser. No. 765,340

Int. Cl.[2] F02C *7/06*

U.S. Cl. 184—6.11 **5 Claims**



1. A method of supplying lubricant to a bearing means supporting a rotating shaft for a predetermined period of time when a primary system for applying lubrication to a bearing means is inoperative, which method comprises the steps of:

maintaining a pressurized reservoir of lubricant with a capacity large enough to supply lubricant to the bearing means for the predetermined period of time;

supplying lubricant from said pressurized reservoir to a gas storage reservoir;

maintaining said gas storage reservoir at a pressure, under normal operating conditions, less than a pressure in said pressurized reservoir, and said gas storage reservoir having a gas-lubricant interface therein;

sensing when there is a malfunction by the pressure in said pressurized reservoir being less than the pressure in said gas storage reservoir, and

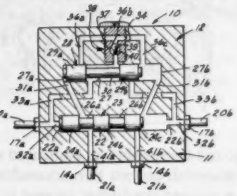
supplying lubricant to the bearings means for the predetermined period of time when the pressure in said pressurized reservoir is less than the pressure in said gas storage reservoir.

4,105,094

SINGLE LINE LUBRICANT REVERSING FEEDER

James J. Callahan, Mentor, Ohio, assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Dec. 14, 1976, Ser. No. 750,369
Int. Cl.² F16N *25/02*
U.S. Cl. 184—7 F **8 Claims**



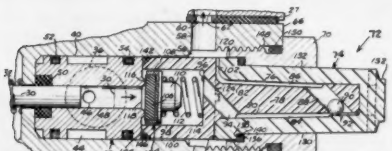
2. A single line lubricant reversing feeder for metering a measured quantity of lubricant from a reversible single lubricant supply line comprising a feeder housing having means forming therein a pair of in-out ports and a pair of corresponding outlet ports, and flow means in said housing including piston means movable between first and second limiting end positions and a single check valve through which is conducted all of the lubricant which flows between said in-out ports in both limiting end positions of said piston means.

4,105,095

INJECTION LUBRICATING APPARATUS

George E. Thrasher, Jr., Pontiac, Mich., assignor to Master Pneumatic-Detroit, Inc., Sterling Heights, Mich.

Filed May 31, 1977, Ser. No. 801,529
Int. Cl.² F16N *13/16*
U.S. Cl. 184—55 A **30 Claims**



12. For a lubricator in which lubricant is moved intermittently, a visual indicator of such movement which comprises,

means forming a body having a transparent region,

said body means having mounting means adapted to be mounted on a lubricator and from which said transparent region projects for visual observation,

said body means being turnable relative to said mounting means about an axis,

said body means having an internal passageway extending between an inlet and an outlet and being adapted to form a flow path for lubricant, said passageway including a portion in said transparent region extending along an axis disposed at a non-perpendicular angle to said axis of turning movement,

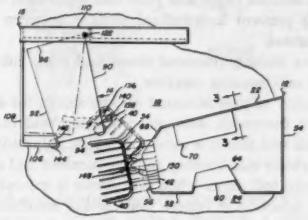
and a bobber in said portion movable responsive to lubricant flow in said path and gravity returnable responsive to cessation of such flow.

4,105,096

CHECKSTAND

Benjamin Charles Baugh, Wichita, Kans.; Norman R. Young, and Glenmore J. Runnion, both of Oklahoma City, Okla., assignors to Unarco Industries, Inc., Chicago, Ill.

Filed May 31, 1977, Ser. No. 801,578
Int. Cl.² E04H *3/04*
U.S. Cl. 186—1 AC **29 Claims**



1. A checkstand for use in a grocery store or the like having a customer aisle for egress of customers and a cart aisle for passage of shopping carts, comprising:

a cash register stand for supporting a cash register-like machine at a level at which a checkout clerk can conveniently operate the cash register-like machine, said cash register stand extending from a position adjacent the floor to said level of said cash register-like machine; and

pivoting means operatively connected to said cash register stand for pivoting said cash register stand from a first position substantially blocking the cart aisle from a position adjacent the floor to said level of said cash register-like machine and in close proximity to a shopping cart during unloading of said cart, to a second position adjacent said cart aisle for freely permitting passage of said shopping cart through said cart aisle after said shopping cart has been unloaded.

4,105,097

LIFT, ESPECIALLY TWO-POST LIFT FOR MOTOR VEHICLES

Horst Hegenbart, Bensheim, Schwanheim, Germany, assignor to Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik, Darmstadt, Germany

Filed May 2, 1977, Ser. No. 792,503
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1976, 7619866[U]
Int. Cl.² B66F *7/28*
U.S. Cl. 187—8.75 **2 Claims**

1. A device for releasably securing two tubular members together comprising:

a cylindrical housing member into which one of said tubular members coaxially extends;

a first plurality of first balls between said cylindrical member and said one tubular member;

second ball cages mounting said first balls for longitudinal movement;

spring means engaging said first ball cages for urging said first cages and balls into a position into which said balls prevent longitudinal motion between said cylindrical member and said one member;

a second plurality of balls between said one tubular member and the other tubular member;

second ball cages mounting said second balls for longitudinal movement;

spring means for engaging said second ball cages and urging said second cages and balls into a position in which said balls prevent longitudinal motion between said tubular members;

a sleeve slidably disposed about said other tubular member and said housing member;

a plurality of pins mounted on said sleeve for sliding movement therewith, said pins engaging said first ball cages when said sleeve is moved in a first longitudinal direction to release said housing and one member and engaging said second ball cages when said sleeve is moved in the opposite direction to release said tubular members.

4,105,098

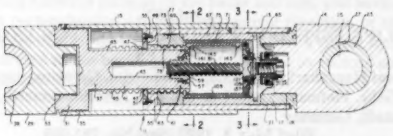
LARGE LOCKING SNUBBER

Martin K. Klimaitis, Alta Loma, Calif., assignor to Pacific Scientific Company, City of Commerce, Calif.

Filed Sep. 30, 1977, Ser. No. 838,286

Int. Cl.² F16F *7/04*

U.S. Cl. 188—1 B **26 Claims**



13. A mechanism for arresting linear motion between first and second relatively moveable objects, comprising:

a pair of telescoping members attached, respectively, to said first and second objects; and

means sensing the motion of said objects for limiting the telescoping of said pair of members when said motion reaches a predetermined threshold, said means comprising:

an overhauling lead screw for producing rotary motion proportional to said linear motion;

a thin walled tube driven rotationally by said overhauling lead screw; and

a thick walled tube driven rotationally by said thin walled tube, said thick walled tube directly interposed between said pair of telescoping members but engaging one of said pair of telescoping members only when said motion exceeds said predetermined threshold.

4,105,099

VOLTAGE RAIL

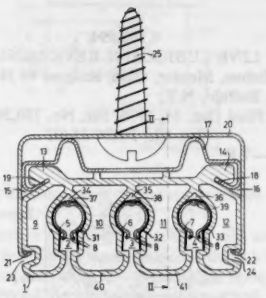
Johannes Kurt Bertrams, deceased, late of Hilden, Germany, and by Casper Antonius Henricus Mulkens, administrator, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 340,767, Mar. 13, 1973, abandoned. This application Jun. 30, 1977, Ser. No. 811,614

Claims priority, application Netherlands, Mar. 18, 1972, 7203660

Int. Cl.² B60M *1/34*

U.S. Cl. 191—29 DM **10 Claims**



9. A voltage rail comprising an elongated support of insulating synthetic material, at least two accessible slots recessed in said support, a current conductor carried in each of said slots for cooperating with contact members of a current consumer when inserted in said slots, said slots being separated by hollow sections of said support material, said hollow sections having at least one enclosed longitudinal cavity formed therein, said voltage rail further comprising a recess in the circumferential surface of said current conductor on a side thereof opposite the accessible side of said slot so as to form a gutter for receiving an adhesive.

4,105,100

HYDRAULIC CONTROL SYSTEM FOR A POWER TRANSMISSION

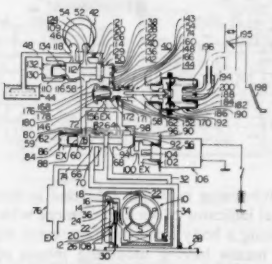
Tetsuya Iijima, Tokyo, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Oct. 21, 1976, Ser. No. 734,591

Claims priority, application Japan, Oct. 22, 1975, 50-126444

Int. Cl.² F16D *23/00, 43/22*

U.S. Cl. 192—.034 **5 Claims**



1. A hydraulic control system for a power transmission of a motor vehicle, comprising means for producing a control pressure of hydraulic fluid for controlling a hydraulically operated clutch of the power transmission, regulator means for regulating said control pressure in accordance with a parameter representative of a function of the output torque of an

engine of the vehicle, delay means for delaying the transmission of variation in the parameter to said regulator means, when the parameter abruptly varies and fails to represent the function, to prevent said control pressure from being varied at the same rate as that of abrupt variation in the parameter, said parameter being a vacuum prevailing in an intake passageway of the engine, said regulator means comprising a modulator valve for producing a modulator pressure varying in accordance with the intake passageway vacuum and movable in one direction to effect a decrease in said modulator pressure and in another direction to effect an increase in said modulator pressure, biasing means for moving said modulator valve in said one direction in response to a decrease in the intake passageway vacuum and in said another direction in response to an increase in the intake passageway vacuum, and a pressure regulator valve for regulating said control pressure in accordance with said modulator pressure and movable in one direction to effect a decrease in said control pressure in response to an increase in said modulator pressure and in another direction to effect an increase in said control pressure in response to a decrease in said modulator pressure, and said delay means comprising means for delaying the response of said biasing means to variation in the intake passageway vacuum when the intake passageway vacuum abruptly varies.

4,105,101

BRAKE OPERATED LOW RATIO RELEASE

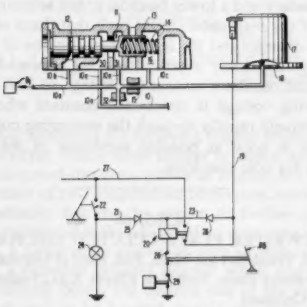
Hans-Joachim Förster, Stuttgart, and Ulrich Eltze, Esslingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 19, 1976, Ser. No. 687,889

Claims priority, application Fed. Rep. of Germany, May 21, 1975, 2522420

Int. Cl.[2] B60K *29/00*

U.S. Cl. 192—4 A **24 Claims**



1. A drive arrangement for motor vehicles with a vehicle brake, and means for raising the idling rotational speed of the driving engine during its warm-up phase comprising automatic transmission means having a drive range including a plurality of speed ratios including at least one servo means for engaging the lowest speed ratio thereof, characterized by control means operable to disengage only the servo-means for the lowest speed ratio of the drive range, in dependence on the actuation of the vehicle brake, and when the transmission means is in the remaining ratios, said ratios remain engaged when said brake is applied.

4,105,102

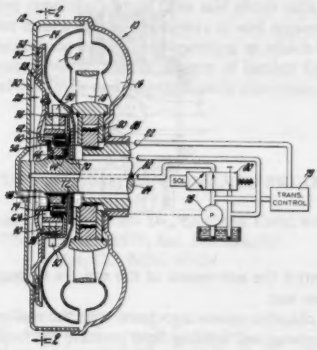
CLUTCH AND DAMPER ASSEMBLY

Terry E. Nels, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 15, 1977, Ser. No. 768,738

Int. Cl.[2] F16D *3/14*

U.S. Cl. 192—106.1 **4 Claims**



1. A clutch and damper assembly comprising; a clutch input member having a friction surface thereon; a clutch output member having an arcuate recess formed therein and a drive lug formed thereon; a retainer housing secured to said clutch input member and enclosing said clutch output member and having an arcuate opening therein into which said drive lug extends normally out of contact with said retainer housing; a first torsion spring and a second torsion spring disposed within said retainer housing and each torsion spring encircling said clutch output member, each torsion spring having first drive end means connected to said retainer housing and second drive end means drivingly connected to said clutch output member; deformable resilient means secured to said retainer housing and extending into said arcuate openings in said clutch output member; and energy absorbing friction means disposed between said clutch input member and said clutch output member; each of said torsion springs permitting a predetermined amount of relative angular movement between said clutch input member and said clutch output member at a predetermined rate, and said deformable resilient means contacting said clutch output member after said predetermined amount of said relative angular movement and thereafter permitting further relative angular movement of a second predetermined amount at a higher predetermined rate, and said drive lug contacting said retainer housing after said second predetermined amount of relative angular movement thereby providing a positive drive connection between said clutch input and output members.

4,105,103

CONVEYOR AND FEED CONTROL APPARATUS

Stanley S. Huffman, Golden, Colo., assignor to Coors Container Company, Golden, Colo.LORADO

Filed Jun. 14, 1977, Ser. No. 806,525

Int. Cl.[2] B65G *11/20*

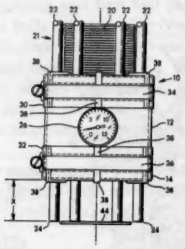
U.S. Cl. 193—32 **25 Claims**

22. Apparatus for conveying and controlling movement of disk-like conveyed articles having a circular outer peripheral portion, such as can end members or the like, comprising:

a plurality of equally circumferentially spaced elongated rigid guide means having innermost peripheral surfaces located along and defining an elongated guideway of generally circular cross-section for controlling passage of the articles therethrough;

resilient means mounted outwardly of and circumjacent to the guideway for resilient radially inward expansion into

said guideway between said elongated guide means with equally circumferentially spaced portions thereof extending inwardly beyond the innermost peripheral surfaces of said elongated guide means for restrictive frictional engagement with equally circumferentially spaced outer peripheral portions of the articles in the guideway to



control the movement of the articles through the guideway; and

fluid chamber means associated with the resilient means for receiving and holding fluid pressure for forcing the resilient means into frictional engagement with the articles in the guideway.

4,105,104

COIN RELEASE DEVICE FOR COIN OPERATED GAMES

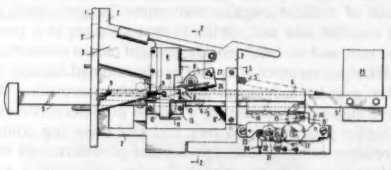
Franz Xaver Leonhart, 8381 Harburg near Pilsting, Ndb., Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 784,351

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617806

Int. Cl.² G07F *5/04*

U.S. Cl. 194—57 **11 Claims**



1. A coin controller device for vending machines comprising a housing, a release rod mounted for longitudinal displacement in said housing, locking pawl means connected to lockingly engage said release rod to normally lock it from longitudinal displacement, a second rod mounted in said housing for independent longitudinal displacement adjacent said release rod, receiver means on said release rod adapted to receive a coin, retainer means connected to said second rod to retain a coin in said receiver means, engaging means connected on said second rod in the path of movement of the upwardly projecting portion of a coin in said receiver means and adapted to engage said coin whereby longitudinal movement of said release rod is also imparted to said second rod, a cam on said second rod connected for moving said locking pawl means out of locking engagement with said release rod on simultaneous movement of said release rod and second rod, return spring means connected to said first rod, and a time delay mechanism operatively connected to control the return movement of said second rod.

4,105,105

METHOD FOR CHECKING COINS AND COIN CHECKING APPARATUS FOR THE PERFORMANCE OF THE AFORESAID METHOD

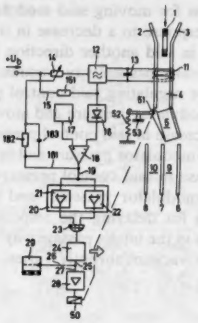
Ludwig Braum, Laufen, Germany, assignor to Libandor Trading Corporation Inc., Monrovia, Liberia

Filed Sep. 20, 1976, Ser. No. 724,768

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1975, 2546685; Nov. 3, 1975, 2549093

Int. Cl.² G07F *3/02*

U.S. Cl. 194—100 A **31 Claims**



1. A method of checking coins comprising the steps of: moving each coin to be checked through a constantly regulated alternating-current field of a measuring coil cooperating with an oscillator, influencing the alternating-current field by the coin to thereby form an oscillator-measuring voltage, rectifying the oscillator-measuring voltage, forming a regulation magnitude from the difference between a reference voltage and the rectified oscillator-measuring voltage, utilizing the regulation magnitude to readjust, by means of a feedback regulation circuit having a time constant and the oscillator, the oscillator-measuring voltage at the measuring coil to a constant value, employing the regulation magnitude as coin checking criterion during checking of a coin in a manner such that there is determined by means of an evaluation circuit whether such regulation magnitude has reached a value located within an upper boundary and a lower boundary, and selecting the time-constant of the regulation circuit such that there can be stabilized slow changes and the feedback regulation of the oscillator occurs sufficiently rapidly that no appreciable change occurs in the oscillator-measuring voltage so that the oscillator-measuring voltage is maintained constant when the coin moves relatively rapidly through the measuring coil and there is obtained as great as possible amplitude of the regulation magnitude for coin checking.

4,105,106

TYPEWRITER PLATEN CLUTCH MECHANISM

Heinz Geis, Frankfurt am Main, Fed. Rep. of Germany, assignor to Adlerwerke vorm. Heinrich Kleyer A.G., Nuremberg, Fed. Rep. of Germany

Continuation of Ser. No. 552,105, Jul. 24, 1975, abandoned. This application Jan. 27, 1977, Ser. No. 763,007

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1974, 2428944

Int. Cl.² B41J *19/80*

U.S. Cl. 400—556.2 **4 Claims**

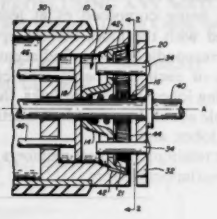
1. In a typewriter having a platen fixedly supported on a center shaft and line indexing wheel rotatably supported on one end of said shaft,

and means releasably coupling said indexing wheel to said platen for selective machine controlled or manual indexing of said platen,

said coupling means comprising a first gear rotatably sup-

ported on and axially movable relative to said shaft, a second gear fixed to said platen and a spring normally axially urging said first gear into meshing engagement with said second gear,

a circular rotary motion transmitting spring secured to said first gear having radially directed notches,



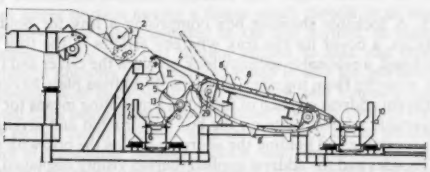
and pins extending axially from said indexing wheel into said notches, said notches gripping said pins whereby rotary motion of said indexing wheel is transmitted through said spring to drive said first gear, said notches further facilitating axial disengaging movement of said first gear from engagement with said second gear guided by said pins to allow said platen to be rotated independently of said line indexing wheel.

4,105,107

FEEDING DEVICE FOR GUIDING PIECES OF LUMBER TO THE ONE OR THE OTHER OF TWO LONGITUDINAL CONVEYORS

Rolf Ekholm, Nyland, Sweden, assignor to AB Hammars Mekaniska Verkstad, Nyland, Sweden

Filed Mar. 14, 1977, Ser. No. 777,048
Claims priority, application Sweden, Mar. 18, 1976, 7603385
Int. Cl.[2] B65G *43/08*
U.S. Cl. 198—358 **5 Claims**



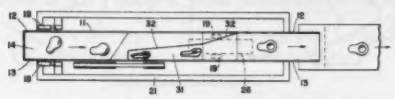
1. A feeding apparatus for receiving lumber from the output end of a conveyor which feeds lumber in lateral arrangement and for guiding and directing pieces of lumber fed thereto to one or the other of two longitudinal conveyors, each of which can longitudinally convey the pieces to further processing devices, characterized in that said feeding apparatus comprises: in sequence, a single piece conveyor with an associated photo cell device, a stepwise drivable winged wheel conveyor disposed immediately below the outfeed end of the single piece conveyor adapted to be located closely adjacent and offset above a first one of the longitudinal conveyors; a second photo cell device associated with the first of the longitudinal conveyors; a stepwise drivable transverse conveyor having its infeed end disposed lower than, aligned with, spaced apart from and downstream of the single piece conveyor and with its other end disposed above the other longitudinal conveyor; a third photo cell device associated with the other longitudinal conveyor; a flap having a downstream edge hinged on a horizontal axis adjacent, parallel to and aligned with the infeed end of said transverse conveyor and swingable about its axis from a bridging position between the outfeed end of said single piece conveyor and the infeed end of said transverse conveyor to a raised position creating a gap between the spaced apart single piece conveyor and the transverse conveyor; power means to raise and lower said swingable flap; power means to operate said single piece conveyor; power means to provide stepwise operation of said transverse conveyor; power means to operate said winged wheel conveyor in stepwise operation; said photo cell devices being situated adjacent their associated conveyors to detect whether or not pieces of lumber are positioned on the associated conveyor whereby automatic equipment can be used to receive condition signals from said photo cells to control the power means for the conveyors of said apparatus and to control the position of the flap depending on which longitudinal conveyor is free to receive a piece of lumber from said winged wheel conveyor and said transverse conveyor, respectively.

4,105,108

APPARATUS FOR ORIENTING HALVED FRUIT CUT SIDE UP

George E. Lauer, 6250 Melville Dr., Oakland, Calif. 94611

Filed Mar. 11, 1977, Ser. No. 776,905
Int. Cl.[2] B65G *47/24*
U.S. Cl. 198—402 **7 Claims**



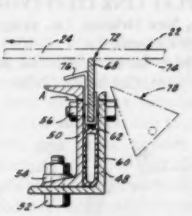
1. Apparatus for orienting halved fruit pieces cut side up, comprising a longitudinally extending table having a receiving end and a discharge end, means for defining at least one channel extending longitudinally on said table, said means including a first side wall extending along the receiving portion of said channel, a bottom panel inclined downwardly to a junction with said first wall; a second portion of said channel coextensive with said receiving portion including a trough formed in a portion of said bottom panel, said trough including generally planar, orthogonally related sides and bottom member, said trough being disposed adjacent to said first wall; a third, discharge portion of said channel including a concave bottom member coextensive with said bottom member of said trough, and means for translating said fruit pieces along said channel from said receiving portion to said discharge portion.

4,105,109

SCRAPER CLEANING APPARATUS FOR ENDLESS CONVEYOR BELT

John J. Schultz, 8405 S. Winslow Rd., Palos Park, Ill. 60464

Filed Mar. 4, 1977, Ser. No. 774,418
Int. Cl.[2] B65G *45/00*
U.S. Cl. 198—499 **5 Claims**



1. A cleaning mechanism for an endless conveyor belt comprising support means mounted transversely of an endless conveyor belt and adjacent the carrying surface thereof, a plurality of scraper elements individually mounted on said support means substantially the length thereof and adapted when biased to engage said belt carrying surface and conform to the contour thereof, and biasing means characterized as being a flexible bladder containing a pressurized medium, said biasing means mounted on said support means and operable to

individually bias each of said scraper elements thereby to effect and maintain a uniform scraping engagement of each of said scraper elements with said belt carrying surface independent of the other said scraper elements.

4,105,110

DOUBLE CHAIN CONVEYOR CONSTRUCTION

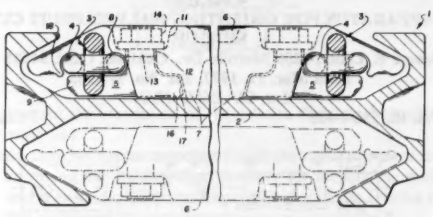
Ernst Braun, and Gert Braun, both of Essen, Germany, assignors to Halbach & Braun, Germany

Filed Mar. 23, 1977, Ser. No. 780,460

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618798

Int. Cl.² B65G *19/24*

U.S. Cl. 198—731 **5 Claims**



1. A double chain conveyor adapted to run in a conveyor trough having a trough bottom on which it is guided, comprising first and second spaced apart chains having interconnected generally horizontally and vertically arranged links and being adapted to run in a conveyor trough in spaced parallel relationships, a transversely extending driver having central seating lug means engageable on the trough bottom with a side surface extending laterally on each side and having a side portion on each side engageable over a portion of a horizontally arranged link and a portion of two adjacent vertically arranged links which are engaged with the horizontal link, said driver also having a substantially vertically extending bolt receiving opening therethrough on each side inwardly of said first and second chains, a yoke member having a bolt portion engageable in a respective bolt receiving opening on each side, each yoke member having a base portion engageable on the trough bottom with a laterally extending bracket part extending between adjacent vertically arranged links and providing a support for the horizontally arranged link, said yoke member also including a laterally extending arm portion extending in an opposite direction from said bracket part in respect to said bolt portion and having a lateral support surface engageable with a respective seating lug side surface.

4,105,111

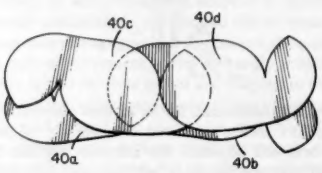
FLAT LINK CONVEYOR

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed May 26, 1977, Ser. No. 800,954

Int. Cl.² B65G *17/08*

U.S. Cl. 198—844 **7 Claims**



6. A multiple link conveyor composed of interleaved flat sheet members each sheet member comprising:

a central portion symmetrical about a longitudinal axis;

a first lobe contiguous with one side of the central portion along said axis and extending transversely from said axis in a first direction;

a second lobe contiguous with the opposite side of the central portion along said axis and extending transversely from said axis in a second direction opposite to said first direction;

each lobe meeting the central portion at a respective point on said axis;

each link being composed of at least one sheet member disposed with the lobes thereof oppositely extending to the corresponding lobes of adjacent links;

the lobes of each link being interleaved with oppositely extending lobes of adjacent links, the adjacent links being pivotable about the coincident meeting points of the interleaved lobes; and

means for retaining the sheet members of each link in contiguous overlapping layers.

4,105,112

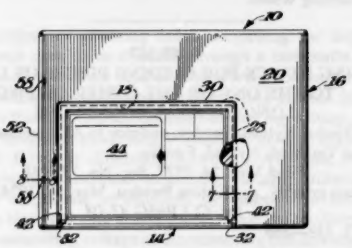
LOCKABLE SHIPPING BOX

John W. Graf, Montreux, Switzerland, assignor to Howmedica Inc., New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,386

Int. Cl.² B65D *55/14*; G09F *3/08*; E05B *65/52*

U.S. Cl. 206—1.5 **13 Claims**



1. A lockable shipping box comprising a tray for holding articles, a cover for the tray whereby articles in the tray are enclosed, a releasable security lock between the cover and tray for securing them together, a reversible address plate having a different address on each of the sides, a mounting means for the reversible address plate on the box constructed and arranged for receiving and holding the address plate on the box with one of its sides and the address applied thereto visibly displayed, an automatic lock between the box and reversible address plate, and the automatic locks including interengaging means on the reversible address plate which secures the reversible address plate to the box when the cover is closed over the tray, the cover has a lid and sides, one end of the cover is hinged to the tray, the hinged end of the cover being open, a pair of auxiliary guide pins extending inwardly from the inner sides of the cover adjacent its lid and open end of the cover, a pair of lower longitudinal auxiliary grooves in the lower portion of the outer sides of the tray for engagement by the inwardly extending auxiliary guide pins in the inner sides of the cover whereby the tray is helped to be guided in a sliding movement within the cover when it is rotated to an inverted position about the hinge and disposed parallel to the tray, combination rotational and slide guide pins extending outwardly from the midportion of the rear sides of the tray, longitudinal guide grooves in the middle of the inner sides of the cover for engaging with the combination rotational and slide guide pins when the tray is slid within the cover for guiding their relative sliding movement, the slide guide pins being shorter than wide, the longitudinal guide grooves having enlarged terminal hinge sockets disposed adjacent the open end of the cover which engage the width of the combination slide guide pins when the cover is rotated out of parallel with the tray whereby the cover is

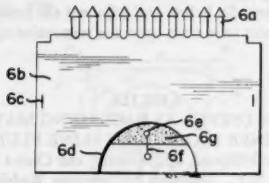
prevented from sliding relative to and is hinged to the tray, and a pair of arcuate guide grooves in the top of the hinged end of the sides of the tray for engaging the auxiliary slide guide pins within the inner sides of the cover when it is rotated closed upon the tray.

4,105,113

SAFETY MATCHPACKET COVER TO PREVENT CHILDREN FROM USING ANY MATCH

Tiburcio Coria Lopez, and Yolanda Teevin Coria, both of Jackson Heights, N.Y.

Filed Jul. 19, 1976, Ser. No. 705,331
Int. Cl.[2] A24F *27/00*
U.S. Cl. 206—100 **1 Claim**



1. In a match holder comprising a plurality of watertight cells each housing the substantial part of the length of a match therein, ignition means within each cell for automatically igniting a match upon the withdrawal thereof, a first cover member holding said plurality of cells in place, a polyethylene coating around the edges of said first cover member hermetically sealing said plurality of cells and insulating each of the cells from moisture and preventing sparks from exiting the cells upon ignition of a match; the improvement comprising completely enclosing said match holder in a second cover member, said second cover member including a top portion and a pair of cover portions hingedly attached to opposite sides of said top portion, one of said cover portions having a plurality of foldably connected flaps on opposed side edges thereof an the other cover portion having a finger notch therein in an edge opposite to the side connected to the top portion, an elastic member having one end thereof affixed to said one cover portion, a plurality of apertures located in said top portion in alignment with each one of said matches, said hingedly connected flaps being secured to said other cover portion to form said second cover member with said opposed cover portions being in substantial parallel relation, said match holder bein slideably received within said second cover member between said opposed cover portions with said matches in alignment with said apertures in the top portion, the other end of said elastic member being secured to said match holder so that when a user slidingly propels said match holder toward said top portion by digital access through said finger notch said matches will protrude through said apertures and, upon removal of the user's finger, the elastic member will cause the retraction of the match holder within the second cover member.

4,105,114

APPARATUS AND PROCESSES

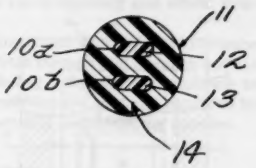
Donald Edward Knox, Canterbury; Suleiman Mohammed Fakira, Ringwood, and Kenneth Andrew William Mitchell, Elwood, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Dec. 13, 1976, Ser. No. 750,019
Claims priority, application Australia, Dec. 30, 1975, 4427/75
Int. Cl.[2] B65D *25/08*
U.S. Cl. 206—219 **17 Claims**

1. In a capsule useful for stabilizing and reinforcing rock formations and for securing elements in boreholes and having

(a) a first compartment in which an amount of a resinous composition is located and

(b) a second compartment located within said first compartment and in which there is located an amount of a hardener composition sufficient to produce a solid composition when said resinous composition and said hardener compo-



sition are admixed and wherein at least said second compartment is fabricated from a flexible frangible material,

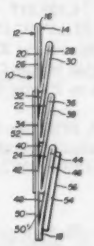
the improvement wherein said capsule further includes (c) at least one non-supple reinforcing member located within said first compartment and attached to said first and second compartments, said reinforcing member being characterized in that it comprises solid polymerized material.

4,105,115

SUTURE AND NEEDLE HOLDER

Ralph S. Horvath, Rte. 1, Box 244B, Houghton, Mich. 49931, and Annette Moore Chapel, Massie Rd., Chassell, Mich. 49916

Filed Aug. 19, 1976, Ser. No. 715,726
Int. Cl.[2] A61L *17/02*
U.S. Cl. 206—370 **24 Claims**

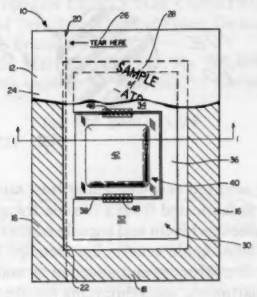


1. A holder for surgical products comprising an elongated base member having a first planar surface and a second planar surface, an elongated facing member provided with a substantially rectangular front side and a substantially rectangular back side and secured on said back side to one of the surfaces of said base member, said facing member having a pair of longitudinal edge portions and a plurality of longitudinal intermediate portions between said edge portions, said intermediate portions being folded over adjacent portions thereof to define a plurality of longitudinally extending pockets adapted to receive surgical products, and one or more storage blocks for surgical needles, each block having a front and back surface and being secured on said back surface to the said front side of said facing member, each block being made from a resilient material and being provided on the front surface thereof with indicia to permit a person to count and store thereon surgical needles.

4,105,116
SAMPLE-CONTAINING ENVELOPE ASSEMBLY

John H. Jones, Westfield, and James T. Hoffman, Readington, both of N.J., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Oct. 29, 1976, Ser. No. 737,006
Int. Cl.[2] B65D *75/00, 75/62*
U.S. Cl. 206—484 7 Claims

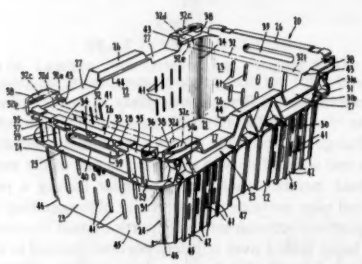


1. A sample-containing envelope assembly, comprising:
(a) a closed envelope,
(b) a relatively flat sample protector of thin pliable plastic material and of generally rectangular shape disposed within the envelope,
(c) the sample protector of thin pliable plastic material having a relatively deep sample-holding pocket of a preselected shape,
(d) a relatively flat and fragile sample disposed within the sample-holding pocket,
(e) the sample having approximately the same thickness as the depth of the sample-holding pocket, and
(f) the sample-holding pocket has a flat floor and its periphery is formed by a raised portion of the pliable sheet material which provides the required thickness to protect the sample.

4,105,117
RE-USABLE PLASTIC CONTAINERS

Howard Dawson Atkin, Beaumaris; Zbigniew Henryk Stachurski, Heathmont, and Brian Wilson Cherry, Glen Waverley, all of Australia, assignors to Plastic Enterprises Pty. Limited, Australia

Filed Sep. 8, 1976, Ser. No. 721,499
Claims priority, application Australia, Sep. 8, 1975, 3080/75
Int. Cl.[2] B65D *21/06*
U.S. Cl. 206—501 12 Claims



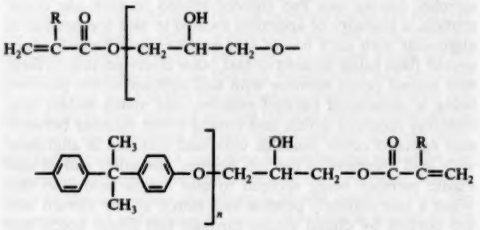
1. A container defined by a base, two opposed side walls and two opposed end walls, and having an upper opening therein, at least said walls formed from a plastics material of the type having a flexural modulus within the range of 200 to 2,000 megapascals as measured by ASTM.D. 790, and which upon removal of a load has the ability substantially to recover to within 5% of its original dimensions as determined by experimental measurement within an accuracy of ± 5%, after being subjecting to a strain of at least 5%, said container including support means to support at least one further container within said upper opening to form a stack of containers, said support means comprising support wires positioned at opposite ends of the container and adapted to rest upon substantially horizontal upper flanges at or near the upper edges of said side walls to overlie or bridge the end portions of said opposed side walls, and force transfer means for transferring forces from said upper flange to a lower flange of said container side wall to distribute said forces over a wider area of said container walls, each said force transfer means comprising strengthening web groups adjacent the portions wherein said support wires rest upon said upper flanges, each said web group extending upwardly from said lower flange and including at least two upwardly converging webs the point of intersection of which is below or substantially below and adjacent the point where the respective support wire rests upon the respective upper flange.

4,105,118
LAMINATES USEFUL AS PACKAGING MATERIALS AND CONTAINER HAVING ALKALINE FLUID MEANS

Robert Franklin Williams, Jr., Webster, and Chen-i Lu, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

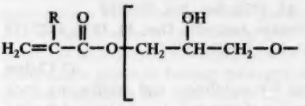
Filed Jun. 10, 1976, Ser. No. 694,758
Int. Cl.[2] B32B *27/38;* B65D *85/84*
U.S. Cl. 206—524.2 18 Claims

1. An article of manufacture comprising a container and alkaline fluid means disposed in said container, said container being at least partially constructed from a heat-sealable laminate having at least first, second and third layers, said first layer being a thermoplastic polymeric film in contact with said alkaline fluid means, said second layer being a barrier layer disposed between said first and third layers, and said third layer being a metal foil; said barrier layer being a radiation-cured layer formed by curing a radiation-curable composition in contact with both said first and third layers, said radiation-curable composition comprising an acrylic monomer and an acrylated epoxy resin of the formula:



wherein R is a hydrogen atom or a methyl group and *n* is 1 to 20.

5. A heat-sealable laminate adapted for use as a packaging material, said laminate comprising (1) a metal foil, (2) a thermoplastic polymeric film, and (3) a radiation-cured interlayer which has been bonded to both said foil and said film by irradiation, said interlayer having been formed by irradiation of a radiation-curable composition comprising an acrylic monomer and an acrylated epoxy resin of the formula:



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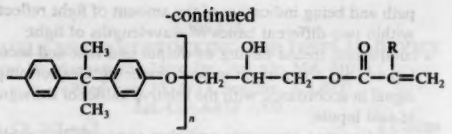


wherein R is a hydrogen atom or a methyl group and *n* is 1 to 20.

4,105,119

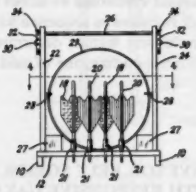
DART GAME HOLDER AND SCORE KEEPER

Arlis L. Cowan, 723 Marshall Ave., Medford, Oreg. 97501

Filed Aug. 12, 1977, Ser. No. 824,242

Int. Cl.² B65D *69/00*

U.S. Cl. 206—579 **3 Claims**



1. An upstanding storing and score keeping frame for target rings and for pointed tip darts of distinctive colors adapted to be thrown at the target rings when the rings are placed upon the ground, said frame including

(a) a normally horizontal lower crossbar having perforations in which the tips of vertically disposed darts are adapted to fit,

(b) upstanding legs at opposite ends of the crossbar;

(c) manually settable score indicating devices on the respective legs,

(d) fixed score identifying reference members affixed to the respective legs in association with the respective score indicating devices, and

(e) fixed fore-and-aft spaced, inwardly directed members carried by the respective legs between which the rings may be confined for storage, the dart receiving perforations in the crossbar being so spaced that the darts, themselves, will contribute to the confining of the rings in stored positions.

4,105,120

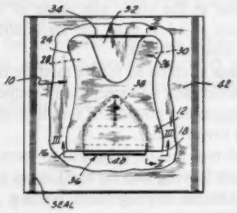
MINIATURE DENTAL KIT

Carl Bradberry, 1509 W. Farwell Ave., Chicago, Ill. 60626

Filed Nov. 26, 1976, Ser. No. 745,241

Int. Cl.² A45D *44/18*; A61C *15/00*

U.S. Cl. 206—581 **1 Claim**



1. Dental hygiene kit comprising:

a pair of sheets of biodegradeable paper material each including a pair of spaced apart arm portions shaped in the form of a tooth with said arms representing roots extending from one end of said kit, said sheets disposed in a superimposed coextending relation and bonded together along their marginal edges to form a chamber therebetween at the other end of said kit, said chamber having an opening in the marginal edge at said other end;

a strip of dental floss permanently secured between the distal ends of said arms, said bonded sheets constuting a first handle for use in applying said dental floss to the teeth; and

tooth scrubbing means disposed in said chamber and removable therefrom through said opening, said tooth scrubbing means including a dentifrice, a scrubbing member carrying said dentifrice and a second handle of biodegradeable material carrying said scrubbing member.

4,105,121

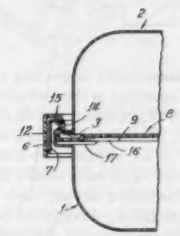
PACKAGE WITH MEDIAN SUPPORTING FRAME AND INTEGRAL DECORATIVE MEDIAL BAND

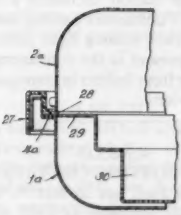
Joseph A. Mascetti, Glen Ellyn, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed May 9, 1977, Ser. No. 794,832

Int. Cl.² B65D *85/30*

U.S. Cl. 206—592 **11 Claims**



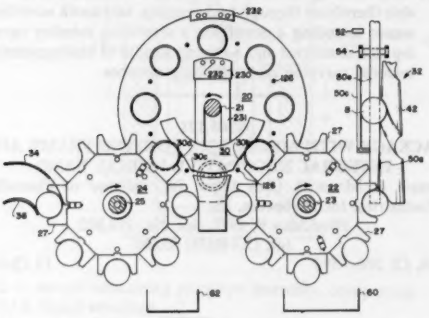


1. In a package including mutually confronting dished base and dished lid, said base and lid being mutually conforming at their peripheries, the improvements which comprise a median supporting frame conforming in size and shape to the peripheries of the base and lid and arranged therebetween and having an upstanding flange located between the overlapping peripheral portions of the base and lid, and means for latching both the base and the lid to said frame, said means comprising latching means elements on the peripheries of the base and lid and detent configurations in said upstanding flange with which said latching means elements respectively mate to latch the base and the lid respectively to said frame, said latching means elements on the periphery of the lid comprising a flange extending outwardly from the periphery of the lid and the detent configurations in the flange of the frame comprising inwardly impressed arcuate beads adapted to receive and hold said lid peripheral flange thereunder, said latching means elements on the periphery of the base comprising arcuate beads inwardly formed in the peripheral portion of the base located and shaped to mate with the inwardly impressed arcuate beads in the flange of the frame to latch the base to said frame.

4,105,122
INSPECTING CANS FOR OPENINGS WITH LIGHT

John Michael Flood; Clifford Harry Messervey, both of Randolph, N.Y.; Richard Dye, Bloomfield, N.J., and Leo Patrick O'Connor, Jamestown, N.Y., assignors to Borden, Inc., Columbus, Ohio

Filed Nov. 26, 1976, Ser. No. 745,191
Int. Cl.[2] B07C 5/344
U.S. Cl. 209—73 40 Claims

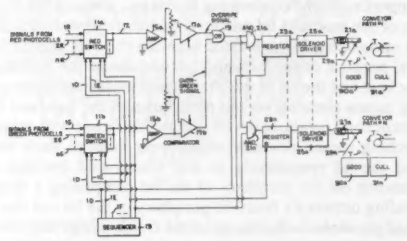


1. Apparatus for automatically inspecting open-ended containers for presence of openings in their structure comprising a rotatable shaft; plurality of photosensitive devices mounted for rotation with the shaft; plurality of holders, corresponding in number to the number of the photosensitive devices, mounted for rotation with the shaft, with each holder disposed opposite a corresponding photosensitive device; each holder includes means for yieldably maintaining a container between a holder and a photosensitive device whereby the device shuts off the open end of the container from exterior light; means for feeding containers between cooperating holders and photosensitive devices; stationary test station, including a light source for illuminating exterior of containers passing therethrough with the photosensitive devices sensing light passing through any opening that may be present in the containers; and means for sorting good container from leakers in response to signals from the photosensitive devices.

4,105,123
FRUIT SORTING CIRCUITRY

Donald W. Irving, San Jose, and Donald W. Chamberlin, Los Gatos, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Jul. 22, 1976, Ser. No. 707,743
Int. Cl.[2] B07C 5/342
U.S. Cl. 209—111.6 9 Claims



1. In a fruit sorter having a plurality of paths over which fruit may be moved, circuitry comprising:

detection means for producing a pair of continuous light reflecting signals for each of said paths, said signals being determined by the light reflected by a fruit moving in a path and being indicative of the amount of light reflected within two different bands of wavelengths of light;

a comparison means having an output and first and second inputs, said comparison means producing a reject output signal in accordance with the relative values of the signals at said inputs;

first and second electronic switches sequentially coupling said pairs of light reflecting signals one each to said first and second inputs respectively of said comparison means;

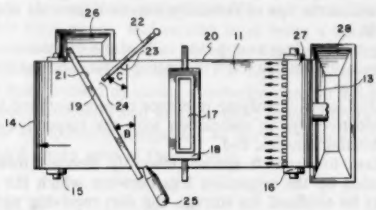
a plurality of means for providing a discharge signal in response to a reject output signal, each of said means for providing a discharge signal corresponding to one of said paths over which fruit may be moved;

a plurality of shift registers sequentially connecting said output of said comparison means to each of said means for providing a discharge signal, and a sequencing circuit simultaneously applying a sequence of switching signals to said first and second electronic switches and enabling said plurality of shift registers in sequence so that each of said pairs of light reflecting signals determines the discharge signal for the corresponding one of said paths.

4,105,124
INCLINED CONVEYOR BELT SOLIDS SEPARATING SYSTEM WITH RESPONSIVE GAS CONTROL

James L. Skinner, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 10, 1976, Ser. No. 749,588
Int. Cl.[2] B07C 1/00
U.S. Cl. 209—114 25 Claims



1. A system for separating spherically-shaped solids which tend to roll down an inclined surface from irregularly-shaped solids which tend to slide down an inclined surface comprising:

a. a conveyor belt-like member having an inclined upper surface, an upper end, and a lower end; said conveyor belt-like member being adapted to move said upper surface from said lower end to and around said upper end; said inclined upper surface of said conveyor belt-like member being inclined upward from said lower end and from horizontal along its longitudinal axis at an angle at least as great as the static roll angle of said spherically-shaped solids and less than the static slide angle of said irregularly-shaped solids;

b. supply means adapted to feed a mixture of said spherically-shaped solids and said irregularly-shaped solids onto an initial impingement portion of said inclined upper surface above said lower end;

c. first receiving means adapted to receive irregularly-shaped solids leaving said inclined upper surface at a point above said initial impingement portion of said inclined upper surface;

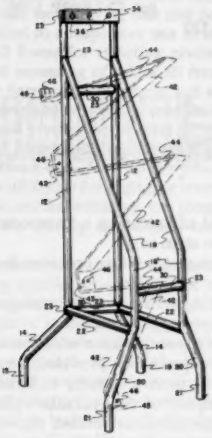
d. lower control means adapted and located to emit jets of gas which retard the rate of rolling of said spherically-shaped solids off said conveyor belt-like member; and

e. second receiving means adapted to receive spherially-shaped solids rolling off said conveyor belt-like member.

4,105,125
Z SHELF BRACKET STOCKING AND DISPLAY DEVICE

Albert H. Magness, 34 Lake Dr., Bel Air, Md. 21014

Filed Feb. 25, 1977, Ser. No. 772,072
Int. Cl.[2] A47F 7/00
U.S. Cl. 211—13 2 Claims



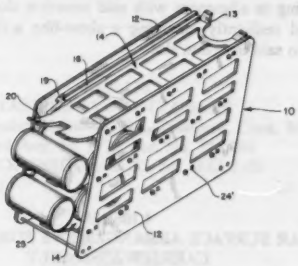
1. A display rack for displaying shelf brackets comprising:
a. a pair of narrowly spaced parallel vertical rear posts having a horizontal integrally attached connecting member adjacent the top of the two rear posts and a second horizontal integrally attached member of substantially the same length connecting the rear post members adjacent the bottom thereof;
b. a pair of front posts spaced apart substantially the same distance as the rear posts and of substantially shorter length than the said rear posts;
c. said front posts having a pair of horizontal integrally attached members extending from each front post rearwardly to each corresponding rear post adjacent the bottom of the said front and rear posts and integrally attached to said rear posts;
d. a portion of said front posts being in a plane parallel with the back posts and the remainder of the upper portion of said front posts being angled upwardly and rearwardly in the same plane with each of the corresponding rear posts and attached thereto;
e. a connecting member for said front posts of substantially the same length as the connecting members for the rear posts and integrally attached to said front posts in a horizontal plane positioned above the horizontal plane of the connecting members of the front and rear posts and positioned within the portion of the front post running parallel with the said rear post;
f. the ends of the front and rear posts below the horizontal plane of the post connecting members connecting the front and rear posts being flared laterally outwardly to engage a supporting surface.

4,105,126
STORAGE AND DISPENSING RACK

John F. Deffner, Lisle; Donald W. Wendel, Mt. Prospect, and Russell M. Barnes, Bloomingdale, all of Ill., assignors to Visual Marketing, Inc., Chicago, Ill.

Filed Aug. 5, 1976, Ser. No. 712,074
Int. Cl.[2] A47F 5/01
U.S. Cl. 211—49 D 4 Claims

1. A rack for storing and dispensing individual containers having a substantially cylindrical side wall and ends substantially perpendicular to the axis of said side wall, said rack comprising:
at least one elongated shelf;
means for supporting said shelf on an incline to allow said containers to roll from one end of said shelf to the other end thereof;
means forming a first level of said shelf for accommodating first containers, said first level forming means comprising an inner base portion of said shelf; and
means forming at least one further level, each successively higher level accommodating containers successively taller than said first containers, said further level forming means

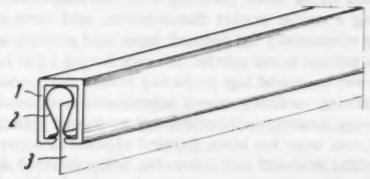


comprising a pair of longitudinally extending rails positioned on opposite sides of said base portion, wherein each said rail has an outwardly extending stepped cross-sectional configuration, the horizontal portions of said rails forming said further levels of said shelf and the vertical portions of said rails forming means to guide said containers along said shelf, and further, wherein the uppermost horizontal portions of said rails are positioned below the uppermost edge of said shelf supporting means whereby said shelf supporting means cooperates with the ends of the tallest containers accommodated by said shelf to positively guide said tallest containers along the full length of said shelf.

4,105,127
HOLDER BAR FOR SHEET-LIKE ARTICLES

Friedrich Höll, Freigericht, Fed. Rep. of Germany, assignor to C. Hohage & Cie. KG, Altena, Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 784,596
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 7610411[U]; Oct. 7, 1976, 2645169
Int. Cl.[2] B42F 1/00
U.S. Cl. 211—124 6 Claims



1. A holder bar for supporting sheet-like articles, comprising
(a) an outer hollow rod of rectangular cross section formed of opposite wide side walls and opposite narrow side walls; means defining a throughgoing insertion slot along the length dimension of one of the narrow side walls medially thereof; and
(b) an inner hollow rod of generally Ω-shaped cross section arranged within said outer hollow rod and being coexten-

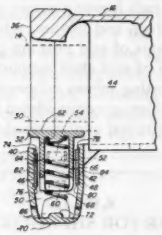
sive therewith; said inner hollow rod being formed of two resiliently cooperating legs each terminating in a foot and a connecting portion attaching the two legs to one another remote from the feet; said legs, viewed from said connecting portion, converging towards one another to define an article-receiving portion; said feet being oriented in opposite directions with respect to one another and extending away from said article-receiving portion; said inner hollow rod being supported by said outer hollow rod solely by a contacting relationship between each said foot and the narrow side wall containing said slot and by a contacting relationship between the other narrow side wall and said connecting portion; said article-receiving portion being in alignment with said insertion slot for receiving and resiliently clamping a sheet-like article introduced into said insertion slot.

4,105,128

WEAR SURFACE ARRANGEMENT FOR COUPLER CARRIER ASSEMBLY

Benjamin B. Spencer, Columbus, Ohio, assignor to Buckeye International, Inc., Columbus, Ohio

Filed Aug. 16, 1976, Ser. No. 714,646
Int. Cl.[2] B61G 9/22
U.S. Cl. 213—61 **3 Claims**



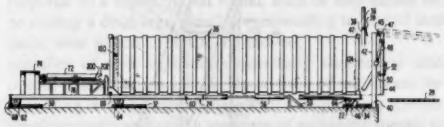
1. A railway coupler carrier assembly of the type having a spring basket defining a carrier pocket with a plurality of compression springs vertically disposed therein, and a coupler carrier having an upper horizontal plate portion for supporting a coupler and a lower portion disposed in the carrier pocket and supported on the compression springs for vertical movement in the pocket, the improvement comprising, in combination, said spring basket including front and rear vertical walls defining a carrier pocket therebetween, said vertical walls having substantially flat opposed upper wall portions approximately parallel to one another and each having a pair of upper and lower horizontal lugs projecting toward the opposite wall and defining vertically spaced substantially horizontal upper and lower locating surfaces defining a recessed area therebetween, said upper lug being disposed adjacent an upper end of its vertical wall and said lower lug being disposed approximately midway between upper and lower ends of its vertical wall, a flat wear plate disposed in each of said two recessed areas, each wear plate being engaged flat against said upper wall portion and being welded thereto with upper and lower wear plate edges adjacent said upper and lower locating surfaces, and said flat wear plates being of a thickness which exceeds the amount by which said lugs project from said upper wall portions, whereby said wear plates guide said coupler carrier during its movement in said pocket and prevent said coupler carrier from engaging said horizontal lugs.

4,105,129

METHOD FOR UNLOADING REFUSE CONTAINERS

Samuel E. Harvey, Knoxville; James Stephen Whitehead, Maryville, and Paul L. Goranson, Knoxville, all of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 641,524, Dec. 17, 1975. This application May 19, 1977, Ser. No. 798,508
Int. Cl.[2] B60P 1/00
U.S. Cl. 214—152 **6 Claims**



1. A method of unloading a transportable refuse container comprising the steps of:

placing a removable refuse container having refuse material therein on a carriage;

advancing the carriage and the container thereon to a container emptying position;

opening the refuse container while on the carriage so that a container opening is provided; extending a hydraulic cylinder to push a slidable bulkhead of the container; guiding an end of the hydraulic cylinder from a position outside the container toward the refuse container with carriage mounted guides;

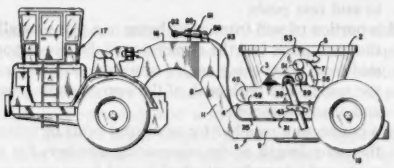
pushing the slidable bulkhead of the container with the hydraulic cylinder toward the container opening to discharge the refuse material from the container opening; and guiding the end of the hydraulic cylinder within the container with container mounted guides.

4,105,130

RECEPTACLE TRANSPORTING VEHICLE

Thomas Lee Richard Hardwick, and Thomas James Hardwick, both of 1212 S. Parker, Olathe, Kans. 66061

Filed Feb. 14, 1977, Ser. No. 768,410
Int. Cl.[2] B65G 7/00
U.S. Cl. 214—314 **10 Claims**



1. A receptacle transporting vehicle comprising:

(a) an elongated mobile main frame having a forward end portion and a pair of side members extending rearwardly from said forward end portion and spaced transversely outwardly from a longitudinal central axis of said main frame, said side members of said main frame each having a rear end portion;

(b) an elongated dumping frame having a forward end portion and a pair of side members extending rearwardly from said forward end portion and spaced transversely outwardly from a longitudinal central axis of said dumping frame, said side members of said dumping frame each having a rear end portion thereof pivotally mounted on the rear end portion of respective side members of said main frame;

(c) an elongated scull frame having a forward end portion and a pair of side members extending rearwardly from said forward end portion and spaced transversely outwardly from a longitudinal central axis of said scull frame, said side members of said scull frame each having a rear

end portion thereof pivotally mounted on the rear end portion of respective side members of said main frame;

(d) extensible means extending between said forward end portion of said main frame and each of said side members of said dumping frame for urging said dumping frame about said pivotal mounting thereof for raising and lowering said dumping frame relative to said main frame;

(e) extensible means mounted on said side members of said dumping frame and each having one end portion thereof pivotally connected to a respective one of said side members of said scull frame for effecting pivoted movement about the pivotal mounting of said scull frame between a first position for carrying a receptacle and a second position for discharging contents of the receptacle rearwardly of the vehicle, said pivotal movements of the scull frame and the dumping frame each supplementing the other in tilting the receptacle; and

(f) means on said scull frame for engaging trunnion portions of the receptacle and for retaining the receptacle in supported engagement during discharging contents of the receptacle;

(g) said extensible means between the dumping frame and scull frame being double acting hydraulic cylinders and operable to swing the scull frame through an arc in the nature of 45° relative to the dumping frame;

(h) said extensible means between the forward end portion of said main frame and each of the side members of said dumping frame being two stage hydraulic cylinders with one stage being double acting and one stage being single acting, said two stages hydraulic cylinders being operable to swing the dumping frame through an arc in the nature of 75° relative to the main frame and the combined movement of the dumping frame and scull frame moves the scull frame through an arc in the nature of one hundred twenty degrees relative to the main frame; and

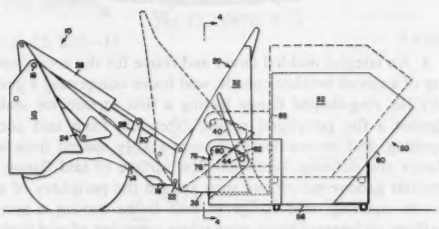
(i) said two stage hydraulic cylinders having the double acting stage operable to retract the dumping frame to a position for the weight of the dumping frame, scull frame and empty receptacle further returns the dumping frame to the first position thereof.

4,105,131

COMBINATION FRONT-END LOADER BUCKET AND REFUSE CONTAINER

Ross Thomas Broderick, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 15, 1977, Ser. No. 833,545
Int. Cl.[2] B65G *65/04*
U.S. Cl. 214—315 **5 Claims**



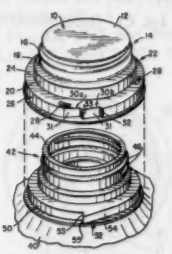
1. In a front-end loader bucket and refuse container combination wherein the container and bucket each include rear, bottom and opposite sidewalls, the container in addition includes a front wall and the bucket is adapted to be vertically pivotally connected to the front end of a loader lift arm structure for powered movement between roll-back and dump positions respectively wherein the bottom wall of the bucket, when considered from front to rear, is inclined upwardly and forwardly and is inclined downwardly and forwardly relative to a horizontal reference plane, the improvement comprising: said container having a pair of brackets fixed thereto and extending rearwardly therefrom at locations spaced transversely from each other a distance slightly greater than the distance between the opposite side walls of the bucket; said brackets each defining a downwardly facing pin guide surface and an arcuate, forwardly facing pin receptacle, with the guide surface forming a forward continuation of an upper terminus of the receptacle; abutment member means fixed between the brackets at a level below the pin receptacles; said bucket, as considered in its roll-back position, having a pair of horizontal, axially aligned pins fixed exteriorly to the opposite side walls thereof and engaged with said pin receptacles; and said abutment member means being engaged with the bottom wall of the bucket.

4,105,132

TAMPER-PROOF CLOSURE

Frederick D. Keeler, 43 Strobel Rd., Trumbull, Conn. 06611

Filed Aug. 19, 1976, Ser. No. 715,884
Int. Cl.[2] B65D *55/02, 85/56;* A61J *1/00*
U.S. Cl. 215—216 **12 Claims**



1. A thermoformed closure thermoformed from sheet plastic material of substantially uniform thickness and of a semi-resilient character, said thermoformed closure having a top wall, a skirt wall with fastening means thereon depending downwardly from said top wall,

a shroud ring extending outwardly from the lower end of the skirt wall, said shroud ring including a shoulder which is generally parallel to the closure top wall and a first wall depending downwardly from said shoulder, said top wall, side wall and shroud ring being of substantially the same thickness throughout except in the areas where deformed,

and at least one locking indent means deformed from said shroud ring and extending inwardly from said first wall, the first wall of said shroud ring being deformable so that the locking indent can be moved.

4,105,133

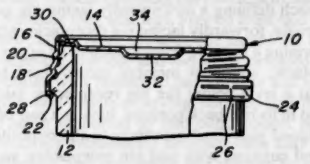
CONTAINER WALL WITH RUPTURABLE WEAKENING LINE

Robert L. La Barge, Ben Avon, Pa., and Robert G. Clawson, Pershing, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 517,324, Oct. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 287,525, Sep. 8, 1972, abandoned. This application May 10, 1976, Ser. No. 684,836
Int. Cl.[2] B65D *17/00*
U.S. Cl. 220—266 **24 Claims**

1. A container wall having a score line therein for forming an opening in the wall and an integral hollow rib in the container wall across the score line projecting from the plane of

the container at least five times the material thickness opposite the direction from which opening pressure is to be applied to



stress the material in the score across the rib in tension and fracture such material.

4,105,134

PRESSURE RELEASE CLOSURES

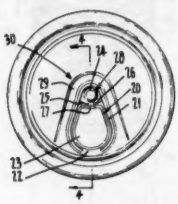
Michael Debenham, Frankston; Allan George Dalli, Warrandyte, and Peter Louis Revell, Middle Park, all of Australia, assignors to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Filed Oct. 4, 1977, Ser. No. 839,213

Claims priority, application Australia, Jun. 10, 1977, 0416/77; Jul. 14, 1977, 0848/77

Int. Cl.[2] B65D *41/32*

U.S. Cl. 220—268 **8 Claims**



1. A sheet metal container member comprising a generally planar area of the container member, an aperture in said planar area, a push-in, pressure releasing, resealable closure integrally connected to said planar area, said aperture being closeable by said closure, said closure being integral through a connection to said planar area, said closure and said connection cooperating to permit said closure to depress into said container by flexing about said connection when push-in force is applied to said closure, said closure being generally adjacent the area immediately surrounding said aperture and being larger in diameter than said aperture to provide an area of said closure and the area immediately surrounding the aperture in sealing overlapping relationship prior to the application of said push-in force, and said connection, said closure and said planar area further cooperating to substantially prevent permanent opening of said closure by a digitally applied push-in force to cause said closure to at least substantially return to said sealing overlapping position upon the removal of said push-in force from said closure.

4,105,135

CLOSURE PLUG

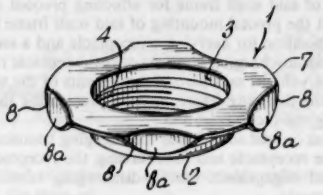
William A. Bradshaw, Weston, and Gerald Dalgleish, St. Catharines, both of Canada, assignors to American Flange & Manufacturing Co. Inc., Linden, N.J.

Filed Feb. 18, 1977, Ser. No. 769,862

Int. Cl.[2] B65D *41/04*

U.S. Cl. 220—288 **1 Claim**

1. A container closure combination comprising a container wall opening surrounded by an internally threaded upstanding cylindrical neck terminating at its uppermost end in an outwardly curled bead, a cup shaped closure plug threadedly engaged within said opening, said plug having a bottom wall surrounded by an upstanding cylindrical threaded sidewall, an annular gasket seat at the upper end of said sidewall, a resilient sealing gasket disposed on said seat, a circumferential lip extending radially outwardly from the uppermost end of said plug sidewall terminating in a peripheral free edge portion, said peripheral free edge portion being deformed downwardly at circumferentially spaced intervals so as to form with said plug sidewall a series of downwardly opening channel shaped



sections separated by remaining segments of said radially extending free edge portion, each of said sections extending downwardly to a position vertically spaced below said gasket seat and presenting a radially outwardly facing torque applying surface for convenient hand rotation of said plug, said outwardly facing torque applying surface being curved radially inwardly for effective hand gripping and forming a doubleconcave relationship with the interior of said plug sidewall.

4,105,136

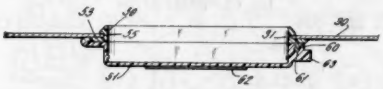
SNAP-IN MOLDED COVER ASSEMBLY FOR ACCESS OPENING

William E. May, Feasterville, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 28, 1977, Ser. No. 763,304

Int. Cl.[2] B65D *51/04, 51/18*

U.S. Cl. 220—339 **11 Claims**

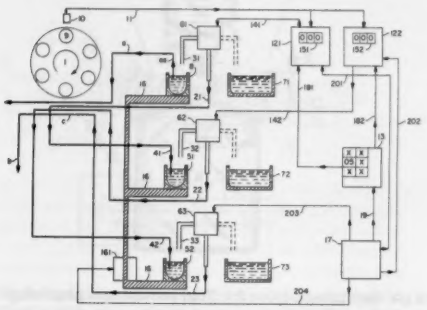


1. An integral molded cover and frame for the access opening of a circuit breaker cubicle; said frame comprising a generally flat ring-shaped flange having a first surface for sealing against a flat peripheral region extending from said access opening, and an annular projection axially spaced from said flange and defining, with said first surface of said flange, an annular groove which can snap around the periphery of said access opening; said flange of said frame having a second surface; an integral hinge connecting one edge of said molded cover to one edge of said frame; said cover having an annular ring-shaped flange surface engageable in surface-to-surface, non-telescoping contact with said second surface of said flange of said frame; said cover being rotatable around said hinge between an open and closed position relative to said frame; said cover being coextensive with said frame; said cover terminating completely at its said flat ring-shaped surface; and snap closure means for holding said cover in its said closed position; said frame and said cover having generally rectangular shapes; said snap closure means being disposed only on the side of same frame which is farthest removed from said hinge.

4,105,137
PROCESS AND DEVICE FOR THE AUTOMATIC DILUTION OF SOLUTIONS

Rudolf Bernet, Zeglingen; Hans Koller, and Eugen Wachberger, both of Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 23, 1976, Ser. No. 699,014
Claims priority, application Switzerland, Jul. 7, 1975, 8837/75
Int. Cl.² G01N *1/10*
U.S. Cl. 222—1 **9 Claims**

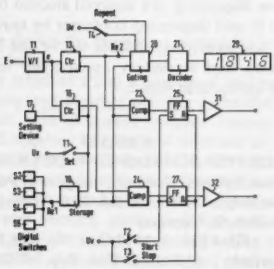


1. Process for the automatic dilution of concentrated solutions with a diluent by means of a peristaltic pump comprising having a peristaltic pump run continuously at a constate rate in one direction thereby defining a suction end and a dispensing end of the pump and for each diluting cycle immersing the suction end alternatively, for a certain number of pump strokes, in the concentrated solution and in the diluent, wherein a dilution operation is comprised of three stages, in which the suction line is immersed in the diluent in the first and last stages and in the solution to be diluted in the middle stage.

4,105,138
APPARATUS FOR PRESETTING VOLUMES OF LIQUID

Karl-Otto Lehmann, deceased, late of Baden-Baden, Germany, by Gertrude Lehmann, heiress, and Dieter Krause, Baden-Baden, Germany, assignors to Apparatebau Hundsbach Prof. Dr.-Ing. Habil., Dr. Phil. Nat. Karl-Otto Lehmann, Nachf., GmbH, Cie., Baden-Baden, Germany

Filed Mar. 2, 1977, Ser. No. 773,656
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1976, 2608995
Int. Cl.² B67D *5/30*
U.S. Cl. 222—14 **7 Claims**



1. Apparatus for metering a quantity of liquid through a line which contains therein a flow meter developing an output signal proportional to flow, means for reducing the flow in the line and means for terminating the flow therein comprising:

(a) a first counter having its input coupled to the output of the flow meter;
(b) means for storing a desired quantity to be metered;
(c) a first comparator having as inputs the outputs of said first counter and said means for storing;
(d) a second counter, said second counter also having as an input the output of the flow meter;
(e) means for presetting a lead value into said second counter;
(f) a second comparator having as inputs the output of said second counter and the output of said means for storing;
(g) a first flipflop having as an input the output of said first comparator, said flip-flop providing its output to control the means for terminating flow;
(h) a second flip-flop having as an input the output of said second comparator and providing its output; an to the means for reducing flow; and
(i) display means having an input coupled to the output of said first counter.

4,105,139
SHELL FOR FLEXIBLE BAG HAVING MOUNTING FOR SPOUT

William R. Scholle, Corona Del Mar, Calif., assignor to Scholle Corporation, Northlake, Ill.

Filed Feb. 18, 1977, Ser. No. 770,087
Int. Cl.² B65D *33/00, 33/38*
U.S. Cl. 222—105 **21 Claims**

1. A fluent dispenser comprising an outer shell having an opening thereto; an inner flexible bag filled with fluent material inserted in said shell through said opening, said bag having a fluent dispensing spout thereon positioned in said shell adjacent said opening, and a generally planar closure for said opening, said shell having means formed integrally therewith for detachably mounting said closure in said opening to retain said bag and spout therein, said bag and spout normally being retained entirely within said shell and closure without fixed attachment thereto for safety and sanitation in shipment and handling, said closure having normally rigid but movable flaps accommodating access to and removal of said spout through said closure and mounting of said spout in fluent dispensing position.

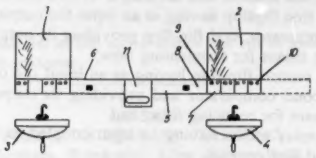
4,105,140
WALL-MOUNTING UNIT ARRANGEMENT FOR LOCATING ABOVE A WASH BASIN AND DEFINING A SHELF WHERE OBJECTS MAY BE DEPOSITED

Eckart Roth, Rosenstrasse 41, 7272 Altensteig, Fed. Rep. of Germany

Filed Dec. 28, 1976, Ser. No. 754,999
Int. Cl.² B67D *5/60*
U.S. Cl. 222—131 **9 Claims**

1. An installation combination for fastening to a wall, for example, above a wash basin, and comprising (1) a shelf with an essentially horizontally running shelf surface for the depositing thereon of objects and (2) additional devices, for example,

medium dispensers in the form of soap, skin lotion or disinfectant dispensers which are arranged in a longitudinal direction of the shelf whereby the lower side of the shelf surface limits the top of a space receiving the additional devices, a space which is covered, at least towards the outside, within the area of the additional devices by means of a plate which can be removed from the shelf; characterized by the fact that the shelf represents, over its entire length, the cut-off length from a shelf section available in any number of meters, that the additional



devices are suspended from the shelf, and that each additional device is covered by a special plate section which, viewed in its cross-section and proceeding from the front area of the shelf surface away from the wall to which the installation combination may be attached, runs towards the bottom and towards the wall by forming a recess towards the wall whereby. with a dispensing section covering a medium dispenser as an additional device, the spout of the medium dispenser penetrates through an opening in the plate section above the recess.

4,105,141

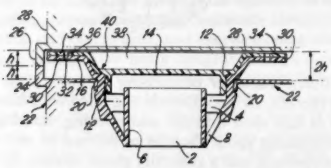
POURING DEVICE

Charles Anthony Lane, Richmond, and Anthony James Lucking, London, both of England, assignors to Waddington & Duval (Holdings) Limited, London, England

Filed Dec. 9, 1976, Ser. No. 749,016

Int. Cl.[2] B67D *3/00*

U.S. Cl. 222—143 **5 Claims**



1. A pouring device adapted to be fixed to an upper surface of a container, said device comprising

a central pouring tube mounted within a body of said device, said body having a substantially cylindrical wall in which there if provided an outer peripheral container engaging groove and air inlet structure positioned around said tube between said tube and wall, said body being extended outwardly and conically from an area adjacent said groove in a widely flared manner away from said pouring tube to a thin planar annulus forming a pouring lip whose plane is higher with respect to said groove than the outer extremity of said central pouring tube, and

a bung fitted in said device, said bung having an interior and exterior surface approximately conforming to the interior shape of said body of said device from an area adjacent said engaging groove outwardly along said conical extension and at least covering a part of said annular pouring lip, said bung having a sealing surface below said annular pouring lip, said bung being fixed to said pouring lip around an annular outer extremity of said pouring lip, and said annular outer extremity being perforated to provide a break away ring.

4,105,142

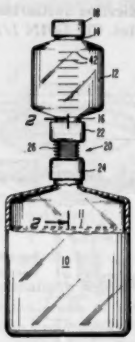
DISPENSING DEVICE FOR FLUID SUBSTANCES

Harold K. Morris, Jr., Rte. 4, Meadow La., Flemington, N.J. 08822

Filed Oct. 7, 1976, Ser. No. 730,482

Int. Cl.[2] B67D *5/38*

U.S. Cl. 222—158 **6 Claims**



1. A dispensing device for fluid substances comprising:

a. a dispensing container for holding a metered amount of fluid substance therein for dispensing, said container defining a primary opening and a secondary opening therein;

b. a capping means detachably affixable over said primary opening to selectively enclose said primary opening as well as to selectively open said primary opening to allow dispensing of a metered amount of fluid substance therethrough;

c. a hollow adapter which includes a dispenser collar being detachably affixable to said secondary opening and further including a holder collar being detachably affixable to a holder of the fluid substance to be dispensed, said holder adapter selectively providing a path of fluid flow communication between the interior of the holder and the interior of said dispensing container, said adapter further including an axially expandable sleeve interconnecting said holder collar and said dispenser collar; and

d. valve means positioned within said hollow adapter to selectively meter the flow of fluid substance through said hollow adapter, said valve means including a plug means held immovable with respect to said holder collar, said plug means positioned extending into said secondary opening of said dispensing container to prevent the passage of fluid substance into said dispensing container from said holder thereof, said plug means being disengageable from said secondary opening of said dispensing container to allow dispensing of a metered amount of fluid from the holder to said dispensing container by temporary expanding of said axially expandable sleeve and being reengageable with said secondary opening by releasing of said axially expandable sleeve.

4,105,143

DEVICE FOR DISCHARGING BULK MATERIAL

Ludwig Blinn, Spiesen, Germany, assignor to Pohlig-Heckelbleichert Vereinigte Maschinenfabriken Aktiengesellschaft, Cologne, Zollstock, Germany

Filed Feb. 3, 1977, Ser. No. 765,312

Claims priority, application Fed. Rep. of Germany, May 2, 1976, 2604327

Int. Cl.[2] B65G *27/18*

U.S. Cl. 222—161 **20 Claims**

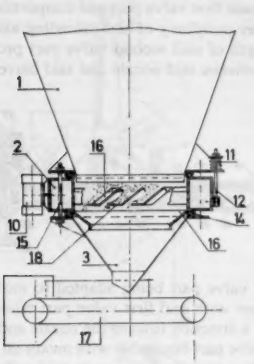
1. A device for discharging bulk material, which comprises an upper hopper adapted to receive bulk material,

a lower hopper disposed under said upper hopper and

adapted to receive bulk material from the upper hopper and to deliver said bulk material,

a substantially cylindrical rigid connecting ring disposed between and resiliently connected to said upper and lower hoppers and defining a flow path between them,

a plurality of blades, which are angularly spaced apart in a



horizontal plane and supported by said connecting ring at fixed points thereof and extend substantially radially in said flow path, and

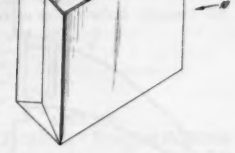
at least two vibration machines mounted on said connecting ring and operable in the same sense of rotation to impart sinusoidally varying, angular oscillations to said connecting ring.

4,105,144

DISPENSER FOR INSECT OR VERMIN POISON

Feng Lin, 455 Ocean Ave., Brooklyn, N.Y. 11226

Filed Sep. 16, 1976, Ser. No. 723,784
Int. Cl.[2] B65D *47/10*
U.S. Cl. 222—187 **7 Claims**



1. A dispensing device for dispensing materials along a wall of a container including:

a backing plate attached along a portion of said wall;

at least one elongated member defining a chamber to hold said materials, said elongated member having a cover member with opposed longitudinal sides and an arch-like portion extending therebetween, said cover member having at least one longitudinally extending weakened area;

means to attach said opposed longitudinal sides of said cover member to said backing plate to define said chamber between said arch-like surface and said backing plate; and

a tear strip attached along the longitudinal surface of said arch-like cover member adjacent to said weakened area to rupture said member,

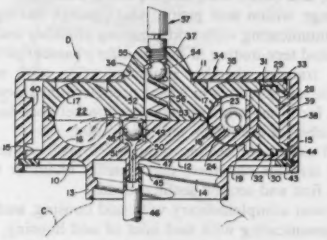
a strip of porous material which is adapted to absorb said material to be dispensed, said strip being attached to said backing plate beneath said cover member.

4,105,145

MECHANICALLY OPERATED DISPENSING DEVICE

Nicholas G. Capra, East Hanover, N.J., assignor to James D. Pauls and J. Claybrook Lewis, both of Miami, Fla., part interest to each

Filed Sep. 16, 1976, Ser. No. 724,006
Int. Cl.[2] B05B *11/00*
U.S. Cl. 222—340 **17 Claims**



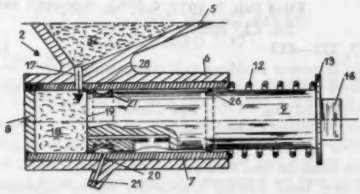
1. In a manually operated dispensing device for dispensing material under pressure, wherein the dispensing device is mounted on a container and has a discharge means for discharging the material from the container, a passage means in communication with the discharge means and with material to be dispensed, movable means in communication with the passage means for pressurizing the material and moving it through the passage means to the discharge means for discharge of the material for use as desired, and manually operable means on the dispensing device and accessible from exteriorly of the device for operating the movable means, the improvement comprising gear means including drivingly interengaged gear teeth on the manually operable means and the movable means for effecting actuation of the movable means when the manually operable means is moved, said gear means including means for effecting disengagement of said gear teeth on the manually operable means from the gear means on the movable means when the manually operable means has been moved a predetermined amount, so that continued movement of the manually operable means on the dispensing device does not cause further movement of the movable means, and to enable the movable means to move in a return direction without causing movement of the manually operable means.

4,105,146

METERING DISPENSER HAVING SUCK-BACK THROUGH NOZZLE

Bernard Broillard, Lieudit "Sur Avellard", Sevrier (Haute-Savoie), France

Filed Sep. 22, 1976, Ser. No. 725,893
Claims priority, application France, Sep. 26, 1975, 75 30277
Int. Cl.[2] B67D *5/40*
U.S. Cl. 222—383 **9 Claims**



1. A metering dispenser for supplying a metered quantity of liquid comprising:

a housing having an inlet, an outlet and a cavity interposed said inlet and outlet;

a piston having a transfer chamber therein, said piston mounted in said cavity and cooperating with the cavity to define a metering chamber; said metering chamber communicating with said inlet and outlet;

first means for sealing said metering chamber, said sealing means mounted to said piston, said first sealing means being operable to terminate communication between said inlet, and outlet with said metering chamber;

a passage within said piston, said passage having one end communicating with said metering chamber and an opposite end terminating in said transfer chamber of the piston, said transfer chamber communicating with said outlet when said piston is in a first predetermined position;

means for terminating communication between said transfer chamber of the piston and said outlet;

second means for sealing mounted to said piston adjacent said transfer chamber, said transfer chamber interposed said first and second sealing means;

a reservoir complementary with said housing, said reservoir communicating with said inlet of said housing; and

means for actuating said piston, said actuating means pivotally attached to said housing and said piston for moving said piston from a fully extended position to a fully retracted position,

wherein, when said piston is in a fully extended position and a liquid fills said metering chamber by way of said inlet while said first sealing means seals said outlet and said piston is moved from said fully extended position to said fully retracted position, said first sealing means seals said inlet so that, said piston moves said liquid from said metering chamber through said passage and into said transfer chamber of the piston,

said means for terminating communication between said transfer chamber and said outlet preventing said liquid from escaping through said outlet until said piston moves to said first predetermined position towards said fully retracted position,

said transfer chamber communicating with said outlet to expel said liquid from said dispenser after said piston moves to said first predetermined position towards said fully retracted position, said transfer chamber expelling said liquid from said metering chamber, passage and transfer chamber, while said piston is moving to said fully retracted position, said transfer chamber further communicating with said outlet to draw in ambient air to expunge said outlet, passage and transfer chamber of any liquid remaining therein while said piston moves from a fully retracted position to said first predetermined position, said metering chamber developing a vacuum when said piston moves toward said fully retracted position past said first predetermined position, said vacuum aiding the filling of said metering chamber with liquid from the reservoir through said inlet after said first sealing means moves to unseal said inlet.

4,105,147

EXTRUDER SCREW VALVE

Paul L. Stubbe, Box 111, Girard, Pa. 16417

Filed Feb. 7, 1977, Ser. No. 765,973

Int. Cl.[2] B29F *1/04;* **F16K** *15/08*

U.S. Cl. 222—413 **15 Claims**

1. An injection molding unit comprising,

a barrel having a generally cylindrical bore therein,

said bore having its first end closed,

a nozzle in said closed end,

a screw having a first end and a second end,

a ram head on said first end of said screw,

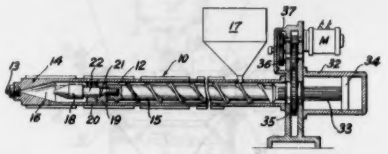
said ram head having a shoulder means adjacent to said screw,

a first valve part on the end of said screw adjacent said ram head engaging said shoulder,

an intermediate part of said ram head extending from said shoulder means to said ram head, slidably receiving a second valve part thereon,

said first valve part and said second valve part being generally cylindrical in shape and slidably and rotatably received in said barrel,

flow means in the outer periphery of said first valve part and extending axially along said outer periphery the entire length of said first valve part and cooperating with means in the outer periphery of and extending axially along the entire length of said second valve part providing a flow passage between said nozzle and said barrel,



said second valve part being adapted to move into seating engagement with said first valve part when said screw is moved in a direction toward the nozzle and means on said second valve part engagable with means on said first valve part holding said flow means in said valve parts out of alignment with each other when said valve parts engage each other interrupting flow from said screw to said nozzle,

said second valve part being adapted to move away from said first valve part when said screw is moved in a direction away from said nozzle whereby material can flow from said screw into the space in said barrel adjacent said nozzle.

4,105,148

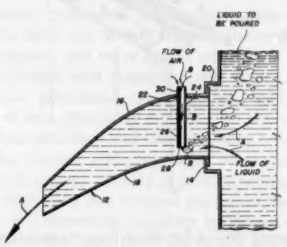
SELF-VENTING SPOUT

William D. Williams, Mahwah, N.J., assignor to Sterling Drug, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 546,329, Feb. 3, 1975, abandoned. This application Oct. 21, 1976, Ser. No. 734,411

Int. Cl.[2] B67D *3/00*

U.S. Cl. 222—478 **5 Claims**



1. A self-venting spout for a closed container, said spout being attached with respect to a wall of the container, said spout having a pair of opposite walls, one of said spout walls being uppermost when the container is turned in order to pour material through the spout, and the other spout wall being lowermost,

a vent in the uppermost spout wall, a piece of substantially straight tubing associated therewith and extending for a short distance out into the atmosphere through said vent and for a major portion of its length into and across for a major part of the diameter of the spout, approaching the lowermost wall and terminating short thereof,

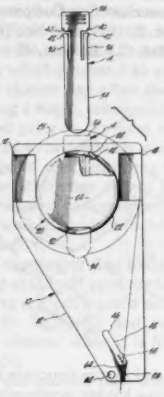
said spout having a pouring orifice, and the vent being remote from the orifice.

4,105,149

TAPE DISPENSING APPARATUS

Hal W. Stewart, P.O. Box 1621, Burbank, Calif. 91507

Filed Sep. 30, 1976, Ser. No. 728,039
Int. Cl.[2] B26F *3/02*
U.S. Cl. 225—25 5 Claims



1. An apparatus adapted to be secured to the apparel of a user for dispensing a length of tape from a tape roll, said apparatus comprising a body member, means carried by said body member for securing said apparatus to the apparel of said user, a walled cylinder protruding from said body member and being adapted to have a roll of tape disposed thereon, said cylinder having a pair of diametrically disposed apertures extending therethrough adjacent the extended end thereof, a locking tab having a tongue portion adapted to extend through said apertures in said cylinder, a head portion extending from one end of said tongue portion and at least one resilient arm portion integrally formed with said tongue portion and extending substantially parallel thereto such that upon disposing said tongue portion through said aperture and over a tape roll, the portion of said walled cylinder adjacent one of said apertures is held between the head portion of said locking tab and the extended end of said resilient locking arm, means carried by said body member for supporting the extended end of said tape roll, said means having a walled channel therein, and cutting means disposed within said walled channel for severing a length of tape from said tape roll.

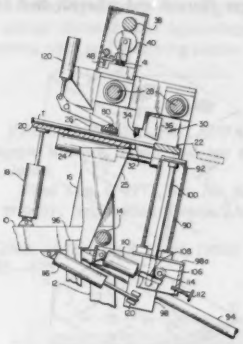
4,105,150

GLASS TUBE CUTTING MACHINE

Thomas A. Insolio, Bristol, Conn., assignor to The Fletcher-Terry Company, Farmington, Conn.

Filed May 16, 1977, Ser. No. 797,002
Int. Cl.[2] C03B *33/06*
U.S. Cl. 225—96.5 12 Claims

1. A machine for cutting and storing segments of elongated members such as glass tubing, said machine comprising a fixed frame, a bed for supporting a plurality of these members in side-by-side relation, an anvil adjacent one end of said bed, means mounting said bed to said frame so that said bed is movable between a first position and a position inclined with respect to the horizontal such that the members are adapted to slide on the bed to assume positions wherein these side-by-side members overhang said anvil, stop means provided in spaced parallel relation to said anvil for engaging the overhanging ends of the members to be cut, a carriage having cutting means thereon, means for causing said carriage to traverse said bed in both said first and said inclined positions so that said cutting means moves across the members to cut them, fixed cull chute means for collecting the segments cut when said bed is in said



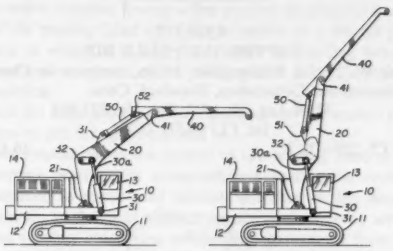
first position, and magazine means for collecting segments when said bed is in its inclined position.

4,105,151

CRANE CONVERSION METHOD

James L. Eltzroth, 282 Westgate St., Wadsworth, Ohio 44281

Filed Aug. 11, 1977, Ser. No. 823,597
Int. Cl.[2] B23K *31/02*
U.S. Cl. 228—170 3 Claims



1. A method of retrofitting a knuckle boom crane designed for excavating purposes comprising the steps of

A. cutting V-shaped notches into the sidewalls of the main boom with the apexes of the notches directed toward the bottom wall of the boom;

B. bending said boom so that the edge surfaces formed by said cutting step are in abutment with each other; and

C. welding said edge surfaces together.

4,105,152

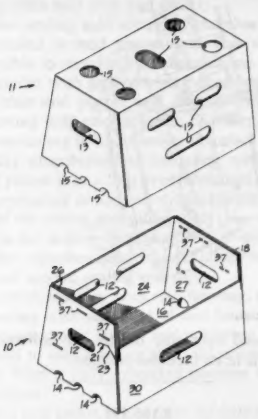
ASPARAGUS CONTAINER

John R. Elward, Novato, Calif., assignor to Fibreboard Corporation, San Francisco, Calif.

Filed Oct. 11, 1977, Ser. No. 840,990
Int. Cl.[2] B65D *5/32*
U.S. Cl. 229—23 BT 9 Claims

1. A container comprising an opened top receptacle adapted to retain foodstuffs or the like therein and a separate cover telescopically disposed on said receptacle, said receptacle comprising a bottom panel, a pair of laterally spaced end panels, a back panel fixedly secured to each of said bottom and end panels and a front panel hingedly mounted on said container for pivotal movement between closed and opened positions, and lock means normally locking said front panel to at least one of said end panels when said front panel is maintained in its closed position on said container, each of said end panels com-

prising a pair of superimposed first and second end panels and means securing each pair of said first and second end panels together, a slit defined by said pair of end panels and terminating at forward edges thereof and wherein said lock means



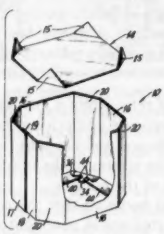
comprises at least one lock flap connected to said front panel and disposed in interlocking relationship within said slit when said front panel is maintained in its closed position, said lock means including means for retaining said lock flap in said interlocking relationship.

4,105,153

PAPERBOARD BULK BIN

Frank W. Locke, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Aug. 26, 1977, Ser. No. 827,944
Int. Cl.[2] B65D *13/04*
U.S. Cl. 229—23 R **16 Claims**



1. A paperboard bulk bin comprising:

a side wall formed from a plurality of alternating, foldably connected, substantially rectangular upstanding side and corner panels, each corner panel having a horizontally disposed stepped flap foldably connected to the bottom edge thereof, each stepped flap being of a width corresponding to the width of the associated corner panel at the bottom edge thereof and having a tongue portion of reduced width at the opposite free edge thereof; each of said side panels having a horizontally disposed, substantially rectangular locking flap, foldably connected to the bottom edge thereof, each said locking flap having opposed cut-outs on opposite side edges thereof, each said cut-out being intermediate the length of said side edge, said stepped flaps and locking flaps being in interengaged locking relationship to form a peripheral base support for the bulk bin; and

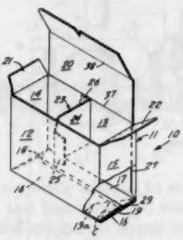
a bottom wall formed from a substantially flat, horizontally disposed panel insert having a perimeter corresponding to the bottom edges of said side and corner panels and overlying the said peripheral support base.

4,105,154

PACKAGING STRUCTURE AND ITS FABRICATION

George Leroy Meyers, and Donald Roy Kuehl, both of Menasah, Wis., assignors to American Can Company, Greenwich, Conn.

Filed Apr. 5, 1977, Ser. No. 784,828
Int. Cl.[2] B65D *5/48*
U.S. Cl. 229—27 **14 Claims**



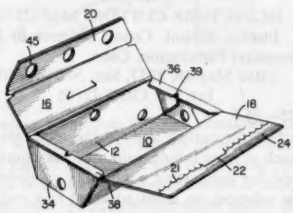
1. In a folding, divided carton structure including a foldable sleeve-like body portion having confronting side wall panels that are relatively closely spaced in a folded mode of said carton structure and less closely spaced in a set up mode of said carton structure, and a closure portion hingedly connected to said body portion, the combination of divider means for said body portion, comprising: at least one divider panel; means defining hinged connection of each of a pair of mutually spaced regions of said divider panel to one of said confronting side wall panels; and means defining detachable interconnection between said divider panel and one of said body and closure portions in the recited folded mode of said carton structure, said means defining hinged connection and said means defining detachable interconnection being so cooperably disposed that, upon unfolding said carton structure to the recited set up mode, said divider panel is pivotable on said hingedly connected spaced regions to release said detachable interconnection and move to a position dividing the region enclosed by said sleeve-like body portion.

4,105,155

DIVIDED AND TAPERED FOOD CARTON

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 4, 1977, Ser. No. 839,399
Int. Cl.[2] B65D *5/28, 5/50*
U.S. Cl. 229—33 **1 Claim**



1. A divided food carton for packaging a plurality of individually wrapped servings of a food product such that the servings have a minimum contact with the top, bottom and side walls of the carton, said carton being prepared from a single blank of foldable sheet material into a configuration of trapezoidal cross section with angularly disposed side walls, comprising:

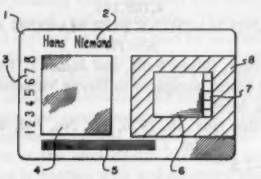
(a) a centrally located bottom panel;

(b) a pair of side walls foldably attached to opposite sides of said bottom panel;
(c) a pair of top closure flaps foldably attached to the ends of said side walls opposite said bottom panel;
(d) an integral divider element having a width substantially equal to the height of the carton foldably attached to the end of one of said top closure flaps, said one top closure flap having a width equal to one-half the width of said carton in the plane between the top of said angularly disposed side walls, and said remaining top closure flap having a width which permits it to overlap and be adhered to said one top closure flap when the carton is closed, and further including a single, substantially straight perforated tear line located prior to the point where the top closure flaps are adhered to one another, said tear line commencing at one edge of said remaining top closure flap and extending to the other edge thereof where there is located at least one unsecured carton opening tab;
(e) a pair of end walls foldably attached to opposite ends of said bottom panel;
(f) a top closure supporting flap foldably attached to each end closure flap at the end opposite said bottom panel, and further including a notch located substantially at the midpoint thereof for accepting and capturing the integral carton divider element when it is folded into position to divide the carton;
(g) a plurality of end closure flaps foldably attached to the ends of said side walls for securing the end walls of said carton to the adjacent side walls; and,
(h) a plurality of ventilation openings in the side and end walls, and divider element of said carton for the purpose of preserving the freshness of the packaged food products.

4,105,156
IDENTIFICATION SYSTEM SAFEGUARDED AGAINST MISUSE

Jurgen Dethloff, Elbchaussee 239, Hamburg, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,035
Claims priority, application Austria, Sep. 6, 1976, 6599/76
Int. Cl.[2] G06K *19/06, 7/06*
U.S. Cl. 235—441 **27 Claims**

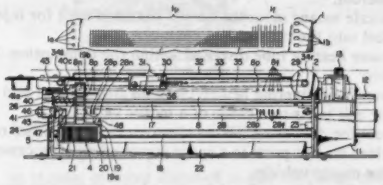


1. In a system, secured against misuse and counterfeiting, for effecting transactions, such as manual or mechanical delivery of commodities, services and money while using identificands, such as credit cards, check cards, cards for automatic machines, coded tokens, keys and the like, provided with identification data, processing data, or both which are readable visually, by a machine, or both, and while using a personal identifying designation, such as a personal identification number (PIN), for verifying the entitlement of the user of the identificand: the improvement comprising, in combination, an identificand having inaccessibly and integrally incorporated therein memories for entry and storage of information therein, including a personal identifying designation; at least the memory for entry and storage of the personal identifying designation being chargeable only once, and at least the contents of the memory for the personal identifying designation being available only within the identificand; verifying means operable to receive said identificand and apply an input thereto; components included in said identificand and activated, responsive to an input from said verifying means, to effect checking of the identity and entitlement of a user of said identificand; and input-output means included in said identificand for establishing communication between said identificand and said verifying means; said identificand including means preventing external access to said memories except through said input-output means when in communication with said verifying means.

4,105,157
PROGRAM READING APPARATUS

Yutaka Kagaya, Kodaira, Japan, assignor to Silver Seiko Ltd., Kodaira, Japan

Filed Aug. 4, 1977, Ser. No. 821,811
Claims priority, application Japan, Aug. 17, 1976, 51-109373[U]
Int. Cl.[2] G06K *13/00;* **D04B** *15/66;* **D03D** *49/00;* **G06K** *7/10*
U.S. Cl. 235—475 **13 Claims**

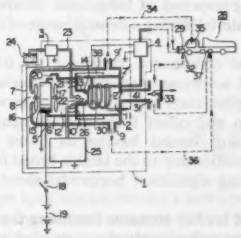


1. In a program reading apparatus having a movable reading head which is mounted for movement from and to a starting position along a path, the improvement comprising:
an arrester member having a first position in which it is clear of the reading head and being movable to a second position in which it is engageable with the reading head to prevent movement of the reading head from the starting position;
means for urging the arrester member from the second position to the first position; and
means responsive to the arrival of the reading head at the starting position for momentarily actuating the arrester member to move said arrester member to the second position so that said arrester member momentarily arrests the reading head from rebounding movement from the starting position.

4,105,158
PREHEATING AND WARMING APPARATUS FOR USE WITH VEHICLES

Nobutoshi Hasebe, Ibaraki; Toshiyuki Itoh, Katsuta, and Takashi Hashimoto, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 7, 1976, Ser. No. 748,330
Claims priority, application Japan, Jan. 19, 1976, 51-4130
Int. Cl.[2] B60H *1/02*
U.S. Cl. 237—12.3 C **16 Claims**



1. Preheating and warming apparatus for use with motor

vehicles and having a cabin and other accessories, such as a radiator, a battery, and an engine, said apparatus comprising:

an outer housing;

an inner housing disposed in substantial axial alignment within the outer housing, said inner housing having one common end wall with the outer housing and further having heat radiating walls;

a clean air inlet port formed in another end wall of the outer housing;

an annular chamber formed between the inside wall of the outer housing and the outside wall of the inner housing;

at least two clean air exit ports formed in the annular chamber;

a combustion gas outlet port formed in the common end wall of the inner housing with the outer housing;

a partition wall dividing the interior space of the inner housing into a clean air introduction chamber on one side thereof and into a combustion chamber on the other side thereof;

a nozzle means mounted on the partition wall for injecting fuel into the combustion chamber;

a water heating tube disposed within the combustion chamber;

a duct for delivering heated clean air from one of said clean air exit ports to a cabin of a motor vehicle;

a duct for delivering heated clean air from the other of said clean air exit ports to a space surrounding an accessory of the motor vehicle;

a plurality of ducts for delivering hot combustion gas from the combustion gas outlet port to a plurality of accessories, each located at different locations of the motor vehicle; and

a water line for delivering water from a radiator of the motor vehicle to the water heating tube and for returning the water at a higher temperature from the water heating tube to the radiator.

4,105,159

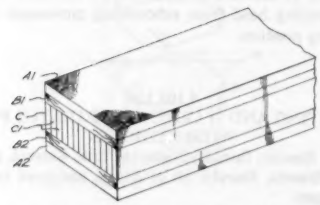
COMPOSITE RAILROAD TIE

Gordon Eldred Brown, 1960 W. 25th, Eugene, Oreg. 97405

Filed Oct. 6, 1976, Ser. No. 730,188

Int. Cl.[2] E01B *3/02*

U.S. Cl. 238—36 **1 Claim**



1. A railroad tie of composite construction, said tie comprising in combination,

uppermost and bottommost elements of rectangular section constituting the top and bottom surfaces of the tie, said elements comprised of hotpressed comminuted liqnocellulosic material having a density range of 0.75 to 1.2 grams per cc,

an innermost component containing the tie neutral axis at laminated hotpressed particleboard consisting of particleboard lamina, each lamina having its broad faces perpendicular to and offset from said elements, each of said particleboard lamina having its fibres substantially in parallel relationship to the lamina broad faces and thereby contributing significant horizontal shear strength to the tie,

dimensioned lumber elements extending the length of the tie and located immediately above and below said innermost component, said lumber elements having a grain direction parallel to and offset from the tie neutral axis, said dimensioned lumber elements offset remotely above and below the tie neutral axis and thereby contributing tensile strength to resist ending loads applied to the tie, and

adhesive means joining all tie components into a unitary mass.

4,105,160

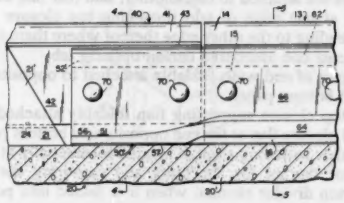
RAIL JOINT BAR FOR NON-UNIFORM RAILS

James LeRoy Ramer, Rte. 1, Box 155, Sullivan, Mo. 63080

Filed May 10, 1977, Ser. No. 795,479

Int. Cl.[2] E01B *11/16*

U.S. Cl. 238—167 **12 Claims**



1. In combination

a first rail having a head for supporting the wheels of a train and a terminal depending web extending downwardly from said head,

a second rail having a head, a web extending downwardly therefrom and a transverse flange at the lower end of said web, and

a joint bar comprising a first, substantially U-shaped portion having a bight at the bottom thereof and a pair of legs, and a second portion having a pair of spaced elements extending longitudinally of said first portion, one from each of said legs,

said first rail being carried only by said first portion and said second rail being secured only between the spaced elements of said second portion.

4,105,161

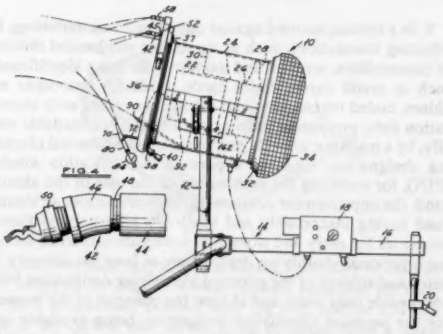
METHOD AND MACHINE FOR MAKING ARTIFICIAL SNOW

Everett F. Kircher, Boyne Falls, and James L. Dilworth, Petoskey, both of Mich., assignors to Boyne Mountain Lodge, Inc., Boyne Falls, Mich.

Filed Nov. 18, 1976, Ser. No. 742,785

Int. Cl.[2] F25C *3/04*

U.S. Cl. 239—2 S **10 Claims**



1. A method of making artificial snow comprising the steps of:

(1) generating in ambient air which is at or below a tempera-

ture of 32° F by means of a ducted fan or blower a substantially unidirectional high-volume air stream at substantially atmospheric pressure in a zone overlying an area of the ground on which the artificial snow is to be deposited,

(2) directing a flow of water in spray form into said air stream solely from a zone disposed generally above said air stream in the vicinity of the maximum velocity of said air stream,

(3) directing a flow of seed crystals into said air stream solely from a zone disposed generally below said air stream, and

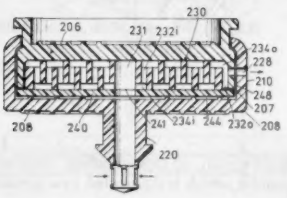
(4) orienting the flows of said water spray and seed crystals at respective acute angles relative to the direction of travel of said air stream such that said flows converge and intermix in said air stream downstream of the respective points of entry of said flows into said air stream.

4,105,162

REGULATED FLOW-REDUCING DEVICE PARTICULARLY USEFUL FOR DRIP IRRIGATION

Mordeki Drori, 89 Zahal St., Kiron, Israel

Filed Feb. 3, 1977, Ser. No. 765,297
Claims priority, application Israel, Oct. 10, 1976, 50650
Int. Cl.[2] B05B 1/30
U.S. Cl. 239—109 **6 Claims**



1. A regulated flow-reducing device particularly useful for drip irrigation, comprising: a housing having a disc-shaped end wall, a disc-shaped closure cap, a fluid inlet formed through said end wall, and a fluid outlet; a flow-retarding member disposed in said housing and having an inlet end communicating with said housing inlet, an outlet end communicating with said housing outlet, and a circuitous flow pathway between said ends and defined at least in part by recesses formed in one face thereof facing the housing inlet and in the opposed face there of facing said closure cap; and a flat disc-shaped regulator member disposed between the housing end wall and said one face of the flow-retarding member such that the face of the regulator member facing the housing end wall is subject to the fluid pressure at the inlet of the housing ; said flat regulator member being in contact with and covering said one face of the flow-retarding member except for its inlet end to provide communication between said inlet end and the housing inlet; said flow-retarding member being made of resilient material so that both its faces are deformable against the regulator member and the disc-shaped closure cap, respectively, by the inlet pressure whereby the cross-sectional area of said recesses on both faces of the flow-retarding member are varied in accordance with the inlet pressure

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4,105,163

FUEL NOZZLE FOR GAS TURBINES

Lewis Berkley Davis, Jr., Schenectady, and Colin Wilkes, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

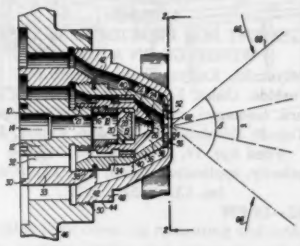
Filed Oct. 27, 1976, Ser. No. 736,159
Int. Cl.[2] B05B 7/10
U.S. Cl. 239—406 **2 Claims**

1. A fuel nozzle for a gas turbine comprising:

a. a central passage for supply of fuel, said passage terminating in an orifice for discharge of fuel;

b. a first annular passage generally surrounding and concentric with said central passage for supply of primary air, said first annular passage having a discharge opening surrounding said orifice and causing air supplied through said first annular passage to be mixed with fuel to provide a conical fuel/air spray having a predetermined spray angle; and

c. a second annular passage for supply of secondary air, said second annular passage surrounding and generally concentric with said first annular passage and having a discharge opening surrounding said first annular passage discharge opening,



d. an annular member disposed in said discharge opening of said second annular passage; and

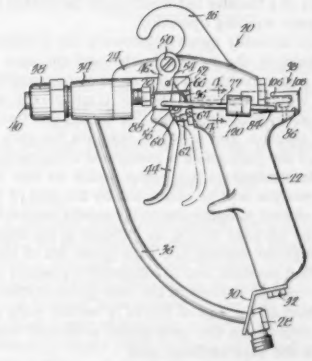
e. said annular member having formed therein a plurality of circumferentially spaced slots, said slots being arranged so as to deliver said secondary air therethrough as a plurality of streams tangentially disposed to said first annular passage discharge opening and in a plane generally normal to the axis of said first annular passage, whereby said secondary air is delivered substantially at the base of said fuel/air spray to develop a low pressure substantially at the base of said fuel/air spray and thereby effect an increase in said spray angle as the spray cone is developed.

4,105,164

TRIGGER LOCK MECHANISM FOR SPRAY GUNS

George W. Lau, Blue Island, and Edward J. Bujnowski, Chicago, both of Ill., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Filed Nov. 26, 1976, Ser. No. 745,294
Int. Cl.[2] B05B 7/02
U.S. Cl. 239—526 **10 Claims**



1. In a trigger lock mechanism for a spray gun, for controllably blocking movement of a trigger thereof from a gun off to a gun on position, an arm secured at a first end thereof to said trigger and extending at a second and opposite end thereof to a position remote from said trigger, said second end being

movable between first and second positions when said trigger is in said gun off position and normally being in said first position, and being constrained for movement generally in a first direction with said trigger upon movement thereof toward said gun on position, and means for blocking movement of said second end in said first direction when said end is in said first position, said second end when in said second position being movable in said first direction past said blocking means, whereby said trigger is blocked by said arm against movement to said gun on position when said second end is in said first position, and is movable to said gun on position when said second end is in said second position.

4,105,165

ARRANGEMENT FOR PROVIDING TRANSFER TAIL WINDINGS ON A BOBBIN

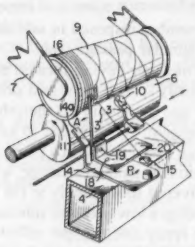
Tsutomu Miyazaki, Kariya; Toshio Yoshizawa, Chiryu; Yoshiaki Yoshida, Ohbu; Kinpei Mitsuya, Aichi, and Takeshi Ogasawara, Gamagori, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Apr. 19, 1977, Ser. No. 788,966

Claims priority, application Japan, Apr. 27, 1976, 51-48321

Int. Cl.[2] B65H *54/02*

U.S. Cl. 242—18 PW **5 Claims**



1. A yarn winding mechanism comprising, in combination:

a bobbin holder for supporting a bobbin for rotation for winding a yarn fed from a supply thereon;

means disposed adjacent the bobbin holder for traversing the yarn fed from the supply in a predetermined width to form a cross-wound package on the bobbin;

suction duct means adjacent said traversing means and having a yarn suction opening for sucking the yarn fed from the supply through the yarn traversing means and to the bobbin into the yarn suction opening in preparation for a formation of a transfer tail winding on the bobbin before a normal yarn winding operation;

a yarn guide movably mounted between the position of the bobbin held by the bobbin holder and the yarn suction opening and movable between an operative guiding position, in which a portion thereof contacts the yarn for guiding it toward the bobbin for forming a transfer tail winding thereon, and in which position the yarn contact portion of the yarn guide is positioned close to the end of the predetermined yarn traverse width so that the yarn contact portion will be contacted by the end of the yarn package during winding due to the axially outward expansion of the package during an increase in the diameter of the package for moving the yarn guide out of the operative guiding position, and an inoperative position in which the yarn contact portion of the yarn guide is spaced from the position of the end of the fully wound yarn package and toward which the yarn guide is moved when contacted by the yarn package; and

cutting means positioned between the yarn guide and the yarn suction opening for cutting the yarn therebetween after the formation of the transfer tail winding, the cutting means being movable between an operative cutting position and an inoperative position and having a portion thereof engaged with the yarn guide for forcing the yarn guide from the inoperative position into the operative guiding position thereof when the yarn cutting means is moved from the operative cutting position to the inoperative position.

4,105,166

TEXTILE YARN OR TAPE WINDING MACHINES

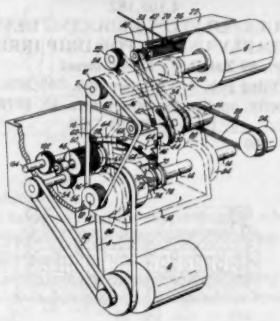
Gordon Mackie, Belfast, Northern Ireland, assignor to James Mackie & Sons Limited, Belfast, Northern Ireland

Filed Apr. 23, 1976, Ser. No. 679,603

Claims priority, application United Kingdom, Apr. 28, 1975, 17590/75

Int. Cl.[2] B65H *59/38*

U.S. Cl. 242—45 **6 Claims**



4. A textile yarn or tape winding machine comprising a take-up spindle which is connected to a variable drive including:

(a) means to sense the surface or peripheral speed of a yarn or tape package being wound;

(b) means to compare the package surface or peripheral speed with a predetermined set speed;

(c) means to vary the drive to the spindle in response to overspeed or underspeed of the actual surface or peripheral speed of the package as compared to the set speed;

(d) constant speed drive means, and

(e) means connected to said constant speed drive means for laying the yarn or tape on the package so as to produce an "open wound" package.

4,105,167

CABLE SPINNING

Hugh Stewart Geddes Knox, Croft, England, assignor to The Cleveland Bridge & Engineering Co., Ltd., Darlington, England

Division of Ser. No. 547,404, Feb. 5, 1975, Pat. No. 4,012,001, which is a continuation-in-part of Ser. No. 385,580, Aug. 3, 1973, abandoned. This application Dec. 8, 1976, Ser. No. 749,393

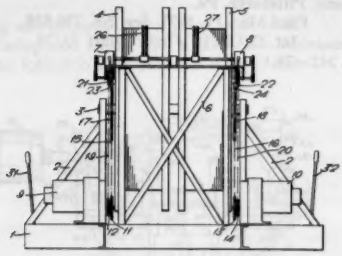
Claims priority, application United Kingdom, Aug. 4, 1972, 36617/72

Int. Cl.[2] B65H *75/00*

U.S. Cl. 242—54 R **1 Claim**

1. In a method of forming suspension cables from wire by an aerial spinning process in the construction of a suspension bridge, the improvement comprising the steps of: unreeling wire for a suspension cable from a permanently mounted first reel of a reeling and unreeling machine by driving said first reel in a forward direction while simultaneously reeling wire onto a permanently mounted second reel of the reeling and unreeling machine by driving said second reel independently of said first reel, unreeling wire from the second reel and reeling wire onto the first reel when the first reel is emptied and the second reel is filled by driving said first and second reels indepen-

dently of one another and in directions of rotation opposite to their respective initial directions of rotation, and driving said



first and second reels with separate, independent and reversible drive means for each of said first and second reels.

4,105,168

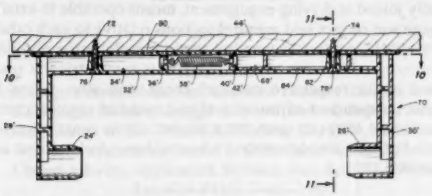
ROLLED PAPER HOLDER

Bernard R. Rutherford, 447 Moorehaven Dr., Carson, Calif. 90744

Filed Dec. 3, 1976, Ser. No. 747,236

Int. Cl.[2] A47K *10/16*

U.S. Cl. 242—55.2 **2 Claims**



2. A rolled paper holder comprising:

a first member assembly adapted to rotatably support one end of a roll of paper;

a second member assembly adapted to rotatably support the other end of a roll of paper;

said first member including a first mounting section, said second member assembly including a second mounting section, said second mounting section being received within said first mounting section and being slideable in respect thereto between a first position and a second position, said first position being capable of rotatably supporting a roll of paper, said second position adapted to permit disassociation and inserting of a roll of paper;

biasing means interconnecting said first mounting section and said second mounting section, said biasing means exerting a continuous bias between said mounting sections tending to maintain said second mounting section in said first position;

separate wall mounting bracket assembly to facilitate attachment to both said first member assembly and said second member assembly to fixedly mount said member assemblies upon a vertical supporting surface; and

a screw fastener assembly interconnecting said first and second member assemblies to said wall mounting bracket assembly, said screw fastener assembly including a screw fastener connecting together said second member assembly and said wall mounting bracket assembly, said screw fastener functioning as a stop to limit the movement of said second member assembly with respect to said first member assembly.

4,105,169

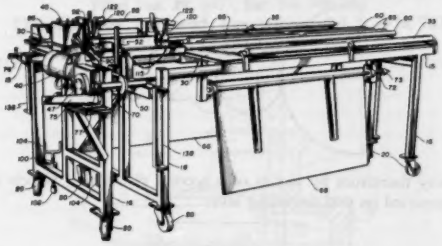
MEASURING AND CUTTING APPARATUS FOR FLOOR COVERING

Gilbert L. Alinder, 17029 Fiesta Ct., Sun City, Ariz. 85351, and Lloyd E. Anderson, 6408 76th Ave. North, Brooklyn Park, Minn. 55428

Filed Jan. 24, 1977, Ser. No. 761,639

Int. Cl.[2] B65H *19/20*

U.S. Cl. 242—56 R **9 Claims**



1. A portable floor covering measuring and cutting machine comprising: a stand having end supports with legs having wheels thereon on each end of the same and with a flat table top extending between the end supports; roller means distributed over one edge of the flat table top; drive motor means and control means therefore mounted on one end of said flat table top; a drive mandrel for mounting a shaft mounted on one end support adjacent said drive motor; a journaled mandrel mounted on the other end support; a shaft removably mounted in said mandrels and extending therebetween for rotation by the drive mandrel; said shaft and said mandrels being positioned to the side of said one edge and below the flat table top and adapted to have the floor covering rolled thereon; a guide plate pivotally mounted on said end supports and positioned below the table top to be pivoted to a position below said shaft; lever means connected to said guide plate to pivot the same; guide means positioned across the width of the table top adjacent said drive motor; measuring means positioned on the table top adjacent said guide means and cooperating with said guide means to measure floor covering moved across the table top; a cutter guide positioned on the table top adjacent the other edge of the table top; and means distributed along the table top for aiding in the movement of floor covering through the measuring device and over the table top to said shaft.

4,105,170

PRESSURE ROLLER ARRANGEMENT

Herbert Schönmeier, Düsseldorf, Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Düsseldorf, Germany

Filed Jul. 20, 1977, Ser. No. 817,278

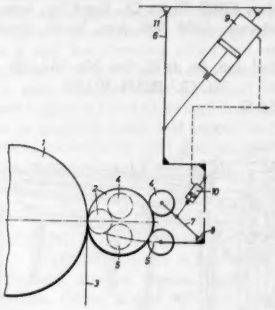
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633408

Int. Cl.[2] B65H *17/08*

U.S. Cl. 242—65 **2 Claims**

1. In a pressure roller arrangement for a winding machine for winding up strip material comprising a support drum bearing against a winding roll, said winding roll being disposed within engaging guide elements on its front sides, said winding roll having bearing thereagainst on the side averted from the support drum a pair of pressure rollers acting on said winding roll between its front sides to press said winding roll against said support drum, at least one of said pressure rolls being borne by a swiveling lever which is supported on a cylinder piston unit, the improvement wherein said device comprises a first pressure roller and a second pressure roller comprising said pair of pressure rollers, said first pressure roller being directly disposed at said swiveling lever, said second pressure

roller being pivoted at said swiveling lever by a follow-up lever so as to be movable on said pressure roller towards and



away therefrom by means of a second piston unit which is supported on said swiveling lever.

4,105,171

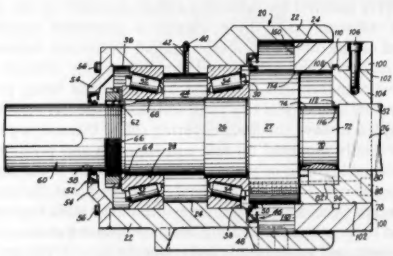
SAFETY DRIVE CHUCK

Joseph Sciola, Upper Saddle River, and Gabor Nagy, Clifton, both of N.J., assignors to Super Chuck, Inc., Paterson, N.J.

Filed Jun. 8, 1977, Ser. No. 804,624

Int. Cl.[2] B65H *19/02*

U.S. Cl. 242—68.4 **4 Claims**



1. A safety drive chuck for the drive of a driven shaft including, housing means, rotatable drive means comprising a rotatable, open-ended socket of a shape which is commensurate with the shape of said driven shaft to provide for the insertion of said shaft into said socket for drive by said drive means, locking means having a generally cylindrical portion and being cooperatively associated with said drive means and said housing means, said locking means being moveable relative to said drive means and said housing means between first locking means-drive means positions wherein said locking means are operable to close said socket and prevent the falling of said drive shaft therefrom, and second locking means-drive means positions wherein said socket remains open, at least two sets of cooperatively associated positioning means on said housing means and said locking means portion, respectively, said positioning means being operable to enable movement of said locking means into said second locking means-drive means position only when said open-ended socket is positioned so that said shaft cannot fall therefrom, said positioning means being spaced by less than 180° on said generally cylindrical locking means portion and on said housing means, said positioning means being disposed on the upper part of said housing means, said housing means comprising spaced, opposed tapered bearing assemblies, means for introduction of a lubricant into the space between said bearing assemblies, and first and second seal means disposed respectively to the sides of said bearings remote from said space, and wherein said drive means comprise a drive shaft which is journalled for rotation in said bearings.

4,105,172

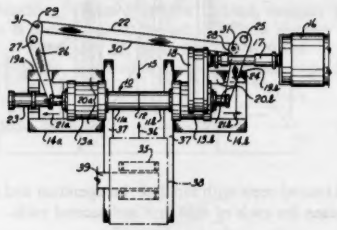
TENSION REEL FOR STRIP COILING

Andrew J. Petros, Oakdale, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.

Filed Mar. 11, 1977, Ser. No. 776,529

Int. Cl.[2] B21C *47/02*; B65H *75/24*

U.S. Cl. 242—78.1 **7 Claims**



1. A strip coiler comprising a rigid frame, a continuous double expansible mandrel rotatably mounted at opposite ends to said frame to receive the end of a strip to be coiled and consisting of two expansible mandrel sections joined endwise in axially separable drive engagement by a plurality of interengaging axially entending projections, means operable to expand and collapse said mandrel sections, drive means connected to rotatably drive one of said mandrel sections and thereby drive both of said mandrel sections in unison for strip coiling on said double mandrel when said mandrel sections are axially joined in driving engagement, means operable to axially engage and retract said mandrel sections relative to each other, each of said expansible mandrel sections including a plurality of radially collapsable mandrel segments symmetrically positioned about respective mandrel cores, and stop means to permit independent adjustment of said mandrel segments relative to said cores to provide a perfect circle mandrel cross section of said double mandrel when said mandrel sections are expanded.

4,105,173

INFLATABLE PARACHUTE FOR USE AS ESCAPE OR SPORTING DEVICE

Henrique Oswaldo Bucker, P.O. Box 18394, Sao Paulo-Sp, Brazil

Continuation-in-part of Ser. No. 694,949, Jun. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 540,996, Jan. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 465,709, Apr. 30, 1974, abandoned. This application Aug. 5, 1977, Ser. No. 822,217

Claims priority, application Brazil, Jan. 16, 1976, 7600243; Nov. 26, 1973, 009238

Int. Cl.[2] B64D *17/72*

U.S. Cl. 244—146 **28 Claims**

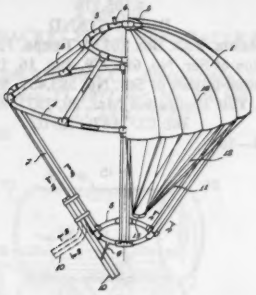
1. An escape or sporting parachute device comprising a parachute canopy having a body harness means suspended therefrom and attachable to the body of a user, an inflatable flexible tubing frame underlying said canopy and opening and supporting the canopy in a use position when inflated, said tubing frame including a pair of ring-like tubing elements beneath the parachute canopy, interconnecting tubing struts between the ring-like tubing elements, a suspended ring-like tubing element of reduced size spaced below the canopy to receive the waist of a user and in inflatable communication with the lowermost of said pair of ring-like tubing elements, and said tubing frame including an inflatable component which extends below said suspended ring-like tubing element and is bendable into contact with a verticle wall or the like to form a spring prelaunching positioning means for the device.

25. A method of ejecting an inflatable type life-saving or sport parachute from a support, said parachute having a canopy with a body harness suspended therefrom, an inflatable

flexible tubing frame underlying said canopy, said canopy having a skirt portion attached to said frame to extend said canopy when said frame is straightened, comprising the steps of:

folding said inflatable frame prior to ejection,

preinflating said frame with a gas while maintaining said frame folded to store potential energy, and



substantially instantaneously releasing said preinflated frame from said folded condition at the beginning of ejection from said support to expand said canopy substantially instantaneously, wherein the straightening of said frame substantially instantaneously pushes said parachute away from said support using said stored potential energy.

4,105,174

DEVICE FOR RECEIVING OR TRANSMITTING RADIATION

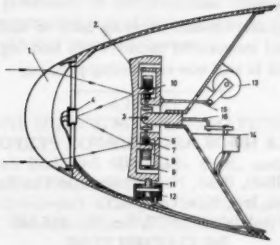
Åke Hugo Petrus Blomqvist, and Rolf Lennart Stålfors, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Continuation of Ser. No. 473,035, May 24, 1974, abandoned. This application May 17, 1976, Ser. No. 687,125

Claims priority, application Sweden, Jun. 8, 1973, 7308109

Int. Cl.[2] F41G *7/14, 7/00*

U.S. Cl. 244—3.16 **6 Claims**



1. Apparatus on a moving vehicle for receiving and detecting radiation transmitted from a remote source irrespective of changes in the line-of-sight between the vehicle and the source,

a support means fixedly secured to the vehicle,

optical lens means having a predetermined focal length and fixedly mounted on said support means,

a mirror,

means including a cardanic suspension for mounting said mirror on the axis of said lens means to said support means,

optical detection means fixedly mounted on said support means and located on the optical axis of said lens means for receiving the radiation reflected thereon by said mirror,

means for pivoting said mirror relative to the axis of said lens means about a pivot located on the axis of said lens means at a distance which is one-half the focal length of said lens means from its focal plane,

and means for rotating said mirror in its own plane to function as a gyro rotor.

4,105,175

RAILWAY SWITCHING POINTS

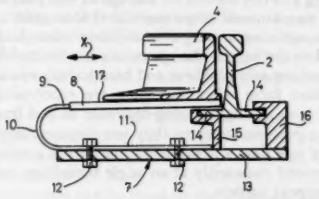
Michel R. De Spiegeleer, Hombeek, Belgium, assignor to Gestivalmo Societe Anonyme Holding, Luxembourg, Luxembourg

Filed Jun. 29, 1977, Ser. No. 811,351

Claims priority, application Luxembourg, Jul. 1, 1976, 75283

Int. Cl.[2] E01B *7/08*

U.S. Cl. 246—430 **13 Claims**



1. A device for a switching point of a railway track, said switching point comprising two movable tongue-rails controlled in such a manner that their ends may be brought in contact with line-rails, or be separated therefrom, by a sliding movement over bearings carried by sleepers, said device being placed in the space between two bearings and comprising a sliding part or piece supporting at least one tongue-rail by means of a self-lubricating sliding surface, said part or piece being influenced by elastic means, so as to lift the tongue-rail or rails which it supports with respect to said bearings, in such a manner that said tongue-rail or rails are not in contact with said bearings during the sliding movement of the tongue-rail or rails, but come directly into contact with the bearings under the influence of the load of a railway vehicle passing over said tongue-rail or rails.

4,105,176

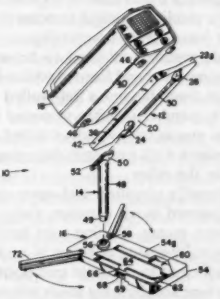
KNOCKDOWN STAND FOR ELECTRONIC INSTRUMENT

James A. Hill, Aloha, and David R. Hargis, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 14, 1977, Ser. No. 768,442

Int. Cl.[2] F16F *15/00*

U.S. Cl. 248—13 **10 Claims**



1. A knockdown stand for use in one assembled form to support a portable electronic instrument at a certain height and attitude above a surface, which stand can be dismantled and

reassembled in another, more compact form for storage or transport, comprising

an elongate post,

an instrument support platform having upper surface means for receiving an electronic instrument to be supported by the stand, and means for removably receiving, in said one assembled form of the stand, an upper end portion of said post,

a base configured to rest on a support surface in a stable manner, said base having means for removably receiving, in said one assembled form of the stand, a lower end portion of said post and holding the post in a generally upright position, complementary configured upper surface means for receiving said platform in nested association in said other assembled form of the stand, and means defining a cavity therein for storage of said post during use of the stand in said other assembled form, and

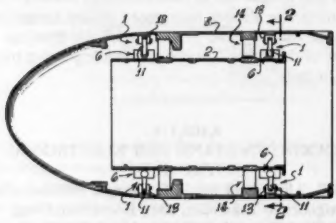
means comprising a pair of stabilizing arms hingedly attached to the base at the opposite sides thereof for releasably locking said platform and base together in said other assembled form when the same are received in nested association, said arms being movable to and from a first, locking position wherein they are disposed adjacent the sides of said base and a second, stabilizing position where they extend outwardly at an angle therefrom and engage said support surface.

4,105,177

BREAKAWAY LINK ASSEMBLY FOR MAINTAINING A STRUCTURAL ALIGNMENT OF SHOCK-SENSITIVE EQUIPMENT

William R. Smith, Godfrey, Ill., and Robert H. Duchild, Chesterfield, Mo., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 14, 1977, Ser. No. 833,121
Int. Cl.[2] F16F *15/00*
U.S. Cl. 248—15 **13 Claims**



1. A breakaway link assembly adapted to be coupled between spaced outer and inner structural members for rigidly maintaining said spacing under low level accelerating forces and for protectively yielding its rigid structural support when subjected to higher level forces comprising:

a crosshead guide member adapted to be secured to said inner structural member and formed with a longitudinally-extending guide track having a flat-walled portion,

a crosshead block member slidably mounted in said track,

plunger latch-like means transversely-carried by one of said crosshead members with a plunger-engaging detent means being formed in the other,

a link arm for pivotally coupling said outer structural member to said crosshead block member, and

pre-loaded resilient means holding said latch-like plunger means in a centrally-seated position in said detent means with a force sufficient to maintain said position under said low level structure accelerating loads whereby said structural member spacing is rigidly maintained,

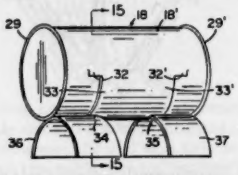
said detent means being formed with a centrally-located relatively steep-walled central ramp section and peripherally with a relatively shallow ramp section; said higher level acceleration forces being sufficient to overcome said resilient pre-load force and permit a guide block displacement in which said latching plunger can ride up said ramps and onto said flat-walled track portion for breaking said rigid link support and preventing direct transmission of said accelerating forces from one structural member to another.

4,105,178

DRUM STAND

Harold F. Mason, P.O. Box 10139, Tampa, Fla. 33679

Continuation of Ser. No. 696,779, Jun. 16, 1976, which is a continuation-in-part of Ser. No. 583,437, May 30, 1975, abandoned. This application Mar. 30, 1977, Ser. No. 782,923
Int. Cl.[2] A47G *23/02*
U.S. Cl. 248—151 **4 Claims**



1. A support device in combination with a substantially cylindrical container having an external surface including indentation means formed in inset relation to the exterior surface of the container, said indentation means extending about a substantial portion of the substantially cylindrical container, said support device comprising:

first and second support leg means each having an arcuate configuration substantially corresponding to the curved surface of the substantially cylindrical container;

lip protection means secured relative to the substantially cylindrical container and disposed in relation to said indentation means to receive said first and second support leg means in a supporting and a non-supporting position;

said lip projection means securing each of said leg means relative to the container when said leg means are maintained in said supporting position to support the container thereby; and

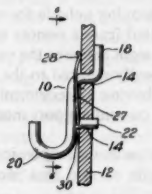
said lip projection means securing each of said leg means within said indentation means when said leg means are maintained in said non-supporting position;

4,105,179

LOCKABLE HOOK ASEMBLY FOR PERFORATED BOARD

Kenneth A. Elliott, Reno, Nev., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,646
Int. Cl.[2] F16M *13/02*
U.S. Cl. 248—221.2 **4 Claims**



1. A lockable assembly for a perforated board having a plurality of spaced perforations therethrough comprising a hook member having a first, offset, board engaging portion, a shank having a second, straight, board engaging portion ex-

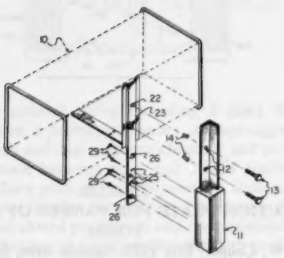
tending therefrom; said second portion having a notch therein; said shank terminating in a bent article suspending portion; and a lock plate having an upper and a lower board surface engaging portions, an opening through which said offset portion of said hook passes and an indentation adapted to engage said notch in a locking relation.

4,105,180

MOUNTING BRACKET FOR A NEWSPAPER DELIVERY BOX

Joel W. Hodge, 208 Riverview Ct., Elizabethton, Tenn. 37643

Filed Jun. 27, 1977, Ser. No. 810,562
Int. Cl.[2] A47G *29/00*
U.S. Cl. 248—300 **2 Claims**



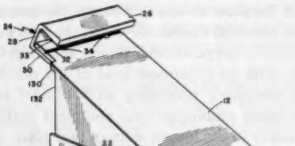
1. A mounting bracket for mounting a box to a support structure and adapted to be attached to the support structure, said bracket comprising an elongated rectangular base having a single rectangularly shaped corrugation formed therein along the center of said rectangular base and parallel to the elongated sides thereof, said corrugation having at least two holes therein for securing the bracket to the support structure, wherein the face of said corrugation is extended from the rectangular base to form a leg having a length sufficient to provide additional means for securing the bracing the bracket to the support structure, and an arm provided at the location where said face of the corrugation is extended from said rectangular base, said arm being positioned in perpendicular relationship to the length of the extended face of the corrugation, for supporting the bottom of a box mounted thereon.

4,105,181

TELEPHONE DIRECTORY INFORMATION SUPPORT BRACKET

Elford Barnett Breitbard, San Diego, Calif., assignor to Tele-Quik, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 677,373, Apr. 15, 1976, abandoned. This application Nov. 26, 1976, Ser. No. 745,409
Int. Cl.[2] A47B *19/00*
U.S. Cl. 248—452 **10 Claims**



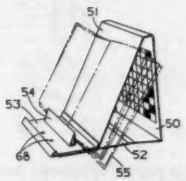
9. A telephone directory information support comprising:
a first planar member for supporting directory information,
a second planar member joined at one of its side edges to one of the side edges of said first planar member,
the opposite side edge of the second planar member having an acute angle with the line of intersection of the side edges of said first and second planar members,
said opposite side edge having securing means for securing said support to the side of a telephone with said opposite side edge being substantially horizontal and said first planar member presenting a flat, upwardly inclined surface for presenting directory information to telephone users,
retainer means positioned at the upper inclined end portion of said first planar member for retaining telephone directory information in visible position on said first planar member,
said securing means comprising at least a pair of spaced apart, upwardly directed leg members that are spaced from said second planar member and that are secured at the lower ends to the lower edge of said second planar member,
the upper end of said leg members having an enlarged end portion for contacting the side of a support member position between the enlarged end portion and the second planar member,
an adapter panel having fixed on one side a second panel that is slidably positioned in the space between said leg members and having means for being secured thereto,
and the lower portion of said panel on the side opposite said leg members having a lower ridge for coacting with a bottom wall edge of the telephone.

4,105,182

MULTIPLE USE STUDY DEVICE

Samuel O. Jacobson, 11255 Gaviota Ave., Granada Hills, Calif. 91344

Filed Jan. 12, 1977, Ser. No. 758,594
Int. Cl.[2] A47B *97/08*
U.S. Cl. 248—459 **8 Claims**



1. A multiple use study device for holding a plurality of articles comprising a single elongated blank of relatively stiff material scored along a plurality of transverse parallel lines so as to be foldable and to hingedly connect a plurality of panels at their contiguous edges, said blank having a first narrow end flap panel portion connected at one end by a first bottom-side crease to one end of a second panel portion, said second portion containing a centrally located, transverse slot, said second portion's other end connected to one end of a third panel portion by a second bottom-side crease, said third portion containing a third bottom-side crease with its other end connected to one end of a fourth panel portion by a fourth top-side crease, said fourth portion containing a centrally located slot cut therethrough, said fourth portion slot located in parallel and longitudinal alignment with said second portion slot, said fourth portion containing outwardly extending tabs at its respective sides each of which contain double bottom-side creases scored in parallel alignment with said fourth panel portion's sides, said second portion's bottom side permanently attachable to said fourth portion's bottom side to form a double thickness tray panel wherein said second portion slot is contiguous with said fourth portion slot, said tray panel reinforced with a third thickness at its sides by said tabs' bottom sides

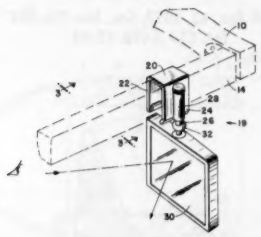
permanently attachable to said tray panel's bottom side, said tray panel structure further reinforced by a triangular tubelike configuration through its forward end formed from said third panel portion, its other end containing a fifth top-side crease which connects to one end a rearwardly inclinable back panel, said first narrow end flap panel portion overlapping and permanently attachable to one end of said back panel's bottom-side wherein said first crease is contiguous with said fifth crease, said back panel's other end connected to one end of a forwardly inclinable prop panel by a narrow panel defined by a pair of spaced bottom-side creases, said prop panel terminating at its other end in a bottom-side crease which connects to one end of a base panel, said base panel bisected with a narrow panel defined by a pair of spaced top-side creases thus permitting said base panel to be collapsible, said base panel terminating at its other end in outwardly extending, laterally inwardly directed cuts from said blank's sides to connect with one end of an outwardly extending, parallel sided, pagestop-bookshelf panel, said pagestop-bookshelf panel laterally bisected by at least two narrow panels defined by at least three spaced creases, a first bottom-side crease, a second top-side crease, and a third bottom-side crease, said pagestop-bookshelf panel terminating in an end flap panel, said pagestop-bookshelf panel foldable so that its narrow panels are insertable through said tray panel slot, said pagestop-bookshelf panel shaped so as to prevent relative lateral movement upon insertion thereof into said slotted tray panel.

4,105,183

REAR VIEW MIRROR ASSEMBLY

Raleigh E. Clark, 7331 S. Kingston, Chicago, Ill. 60649

Filed May 20, 1976, Ser. No. 688,126
Int. Cl.[2] A47G *1/24;* G02C *7/14*
U.S. Cl. 248—484 **1 Claim**



1. For use with a pair of eyeglasses having temples, a rear view mirror assembly comprising a flexible, inverted U-shaped bracket adapted to be received frictionally over one of the temples, a hollow housing mounted on and to an outer side surface of said bracket, a shaft journaled in said housing, a pivot member mounted to the lower end of said shaft, a planar member depending from and secured to said pivot member, and a reflective surface on at least one side of said planar member.

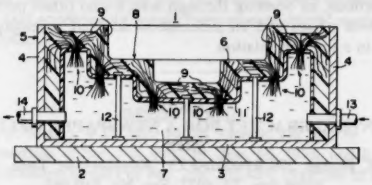
4,105,184

PLASTIC MOLDING ASSEMBLY FOR MOLDING PLASTIC PRODUCTS

Ushigoro Sumitomo, 458-43, Oaza Nishiasuma, Omiya-shi, Saitama-ken, Japan

Filed Jul. 1, 1977, Ser. No. 812,256
Claims priority, application Japan, Jul. 13, 1976, 51-83351; Dec. 1, 1976, 51-144298; Dec. 1, 1976, 51-161011; Dec. 1, 1976, 51-161012
Int. Cl.[2] B22D *15/00*
U.S. Cl. 249—79 **14 Claims**

1. A plastic mold for molding plastic products comprises a plastic mold body, a cooling chamber positioned adjacent to said plastic mold body for flowing a cooling medium to cool said body, and a large number of metal radiating wires of good heat conduction and easy plastic deformation buried throughout inside the plastic portion of said plastic mold body and



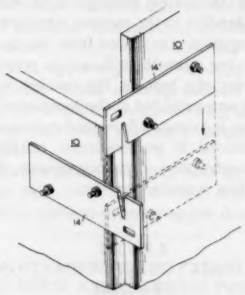
positioned within the cooling chamber in such manner as to discharge heat into said cooling medium.

4,105,185

CONNECTION PLATE FOR PANELS OF A CONCRETE FORM

Leonard W. Cooper, Box 1389, Salmon Arm, British Columbia, Canada

Filed Apr. 6, 1977, Ser. No. 785,277
Claims priority, application Canada, Oct. 1, 1976, 262507
Int. Cl.[2] E04G *17/02*
U.S. Cl. 249—194 **6 Claims**



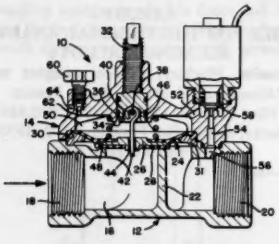
1. A connector for panels of a form, comprising a flat metal plate of elongated rectangular shape with holes in a first longitudinal portion thereof for fixing the first portion to a panel, the plate having a second longitudinal portion having a notch communicating with one of the longer sides of the plate, the notch having a width which is greater at all points than the thickness of the plate so that said notch can interengage with a notch of an identical connector when the two connectors are fixed to mutually perpendicular panels and inverted relative to each other, with an outermost land of the notch of the first-mentioned connector providing an abutment surface which retains the other connector said abutment surface extending perpendicularly to the longer sides of said plate, and the innermost land of the notch sloping away from said outermost land to provide an enlarged entry into said notch, said second portion also having an aperture extending at least partially beyond said abutment surface, relative to the first portion, for receiving a whaler bar extending perpendicularly to the connector, said connector being free of protuberances beyond the plane thereof.

4,105,186

FLOW CONTROL VALVE

Ralph H. Eby, Metamora, Ind., assignor to Skinner Irrigation Co., Cincinnati, Ohio

Filed Sep. 27, 1976, Ser. No. 726,824
Int. Cl.[2] F16K *31/126*
U.S. Cl. 251—35 3 Claims



1. In a flow control valve including a fluid flow path through said valve, a pressure chamber, a diaphragm separating said flow path and said pressure chamber and movable by differential pressure between open and closed positions with respect to said flow path, a flow adjustment stem projecting into said pressure chamber for limiting movement of said diaphragm from said closed position to said open position thereof, said diaphragm having an aperture therethrough to allow fluid pressure on the flow path side of said diaphragm to be transmitted to the pressure chamber side of said diaphragm, and a metering rod extending through said aperture in said diaphragm, the improvement comprising:

means defining an opening in an inner end of said flow adjustment stem,

a pressure relief port formed in said inner end of said stem and communicating with said opening in said stem,

a pin projecting through said inner end of said stem and across said opening,

means defining a loop on an end of said metering rod positioned within said pressure chamber, and

said loop on said rod loosely receiving said pin whereby said metering rod is mounted for movement about the looped end thereof to accommodate non-uniform movement of said diaphragm and prevent binding of said metering rod in said diaphragm aperture.

4,105,187

SEALING SYSTEM FOR SHUTOFF UNITS

Richard Huber, Mödling bei Vienna, Austria, assignor to Klinger AG, Zug, Switzerland

Filed Oct. 4, 1976, Ser. No. 728,961
Claims priority, application Switzerland, Oct. 9, 1975, 13142/75
Int. Cl.[2] F16K *1/38*
U.S. Cl. 251—334 3 Claims

1. A sealing system for a shutoff unit comprising

housing and blocking members of the shutoff unit,

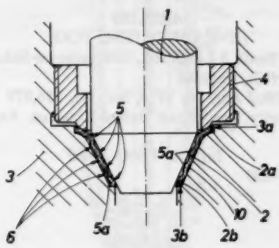
an annular metallic sealing element having a thin walled portion which is elastically deformable under a closing force between said housing and blocking members of said shutoff unit,

at least two annular supporting areas on each of said housing and blocking members which under the closing force make sealing linear contact with and deform said thin walled portion of said sealing element,

and free spaces for deformation of said thin walled portion therein, under the maximal closing force on opposite sides of said thin walled portion from each of said annular supporting areas and enclosed by said thin walled portion and said other member than said member making the linear contact at the annular supporting area,

said annular supporting areas adjacent each of said free spaces for deformation, and said spaces on a member extending substantially parallel to said supporting areas on said same member,

means for restricting the movement of the peripheral edges of said sealing element to prevent increasing said ring width of said sealing element including means for restrictively holding one of the peripheral edges against movement while the opposite peripheral edge extends into unattached abutting relationship with one of said members of the shutoff unit,



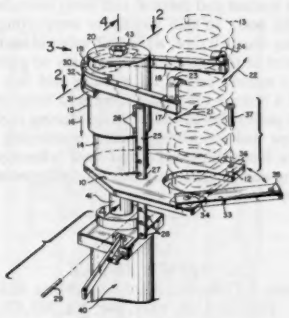
said sealing element having a predetermined ring width with said thin walled portion having a substantially same thickness at least along the portion extending out of the restrictively held peripheral edge.

4,105,188

POWER SPRING COMPRESSOR ACCESSORY

Gregory E. Mendoza; Donald Ray Henthorn, and James Franklin Taylor, all of Simi Valley, Calif., assignors to QMA Inc., Simi Valley, Calif.

Filed Dec. 5, 1977, Ser. No. 857,127
Int. Cl.[2] B23P *19/04*
U.S. Cl. 254—10.5 7 Claims



1. A power spring compressor accessory comprising, in combination:

(a) an horizontal base plate having forwardly extending spaced feet for insertion between adjacent lower coils of a spring to be compressed;

(b) a fixed vertical cylinder having its lower end secured to said base plate;

(c) a movable cylinder positioned in vertical coaxial telescoping relationship with said fixed cylinder;

(d) a pair of forwardly extending arms pivoted to said movable cylinder for swinging movement in a horizontal plane about parallel vertical axes to bring their extended ends closer or further apart; and,

(e) hook means secured to each extending end of said arms for engaging over an upper coil of said spring to be com-

pressed, the distance between the extended ends being adjusted to correspond to the diameter of said spring whereby application of a force telescopes said movable cylinder downwardly with respect to said fixed cylinder to result in compression of a spring positioned between said feet and said arms, the telescoping action of said cylinders providing for a vertical rectilinear motion in the compression of said spring.

4,105,189

LINE DIVERTING TOOL

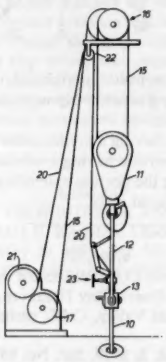
John Horace Beall, 3 Links Rd., Gorleston-on-Sea, Great Yarmouth, Norfolk, England

Filed Aug. 20, 1976, Ser. No. 716,079

Claims priority, application United Kingdom, Aug. 23, 1975, 35073/75

Int. Cl.[2] B66C *23/60*

U.S. Cl. 254—139 **5 Claims**



1. In combination with a drill pipe and means for supporting and axially reciprocating the drill pipe, a line diverter unit comprising a body having a bore passing therethrough from a top end to a bottom end thereof, said body including means for attaching the body to said means for supporting and axially reciprocating the drill pipe, a shut off valve in said body, a first pulley located at the top end of said body to guide a line into said bore, a second pulley for passing said line to said first pulley, and a linkage extending from said body and mounting said second pulley thereon, the linkage during reciprocation of the drill pipe and supporting means positioning said second pulley away from the axis of said bore whereby a sand line extending upwardly from said second pulley remains clear of said drill pipe supporting means.

4,105,190

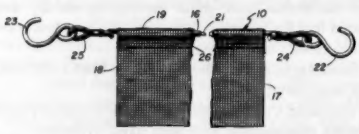
SAFETY DEVICE

Fred J. Curtis, 7 Colby St., Northboro, Mass. 01532

Filed Feb. 10, 1977, Ser. No. 767,579

Int. Cl.[2] E04H *17/00*

U.S. Cl. 256—1 **4 Claims**



1. Barrier device, comprising:

(a) an elongated strip of highly-visible fabric, the fabric being fluorescent and open mesh that allows the passage of air and the strip being provided with a hollow seam along one side, and

(b) a support element consisting of a length of stretchable cord extending along one side of the strip in the seam, and extending from both ends thereof, and wherein each end of the cord is provided with an S-shaped clip, and the fabric and support element are folded along the width of the fabric and enclosed in a fabric envelope having on half of one side a clear window extending the width of the fabric.

4,105,191

CRUCIBLE FOR THE THERMAL ANALYSIS OF ALUMINUM ALLOYS

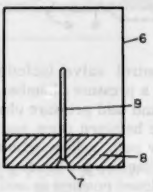
Jean Charbonnier, Herblay, France, assignor to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Jun. 27, 1977, Ser. No. 810,410

Claims priority, application France, Jul. 9, 1976, 76 22441

Int. Cl.[2] F27D *21/00*

U.S. Cl. 266—88 **3 Claims**



1. A crucible for the thermal analysis of aluminum alloys comprising:

a metallic cylindrical envelope having a base, the cylindrical side wall extending upwardly from said base being formed solely of a thin metal sheet, a central hole being formed in the base;

a cake of heat-insulating material at the bottom of said envelope and matching the shape thereof, said cake having an axial hole formed therein, said hole being coaxial with said central hole and forming an extension of the central hole in the base; and

a metallic thin-walled thermocouple sheath having a sealed upper end secured in the axial hole in the cake, the sealed upper end being located roughly midway along that portion of the cylindrical side wall that extends above said cake, the lower open end of said sheath being spaced from and out of contact with the metallic base of the envelope.

4,105,192

PROCESS AND APPARATUS FOR PRODUCING ZIRCONIUM SPONGE

Kazuhiko Ishimatsu, Higashi-Kurume; Takao Nakahara, Wako; Akira Murata, Tokyo, and Masami Kuroki, Urawa, all of Japan, assignors to Nippon Mining Company, Tokyo, Japan

Division of Ser. No. 631,293, Nov. 12, 1975. This application Apr. 23, 1976, Ser. No. 679,624

Claims priority, application Japan, Feb. 13, 1975, 50-17474

Int. Cl.[2] C22B *61/02*

U.S. Cl. 266—149 **5 Claims**

1. An apparatus for producing zirconium sponge comprising:

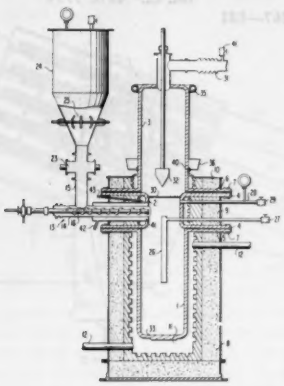
a reaction chamber having an outwardly turned flange at one end thereof and being closed at the opposite end by a bottom plate, said chamber being joined to a vessel also equipped with an outwardlyly turned flange at one end, a port at the other end for introducing inert gas into said vessel, and a piercing rod extending through said port parallel to the major axis of said vessel;

said chamber being joined to said vessel via a cylindrical seat means comprising outwardly turned flanges compatible with and secured to the outwardly extending flange of said vessel and said reaction chamber, respectively, an

inner face projecting slightly inward of said reaction chamber having circumferentially attached thereto a circular plate sealing the inside of said reaction chamber from the inside of said vessel, and first and second pipes extending through the portion of said seat means in communication with said reaction chamber, said first pipe introducing inert gas to said reaction chamber and said second pipe having extending downwardly into said reaction chamber for introducing manganese to said chamber and discharging manganese halide from said chamber;

said apparatus further comprising a screw feeder in communication with a reservoir supplied with powdered zirconium halide, said screw feeder comprising a screw shaft mounted within a sleeve having a port therein for receiving solid zirconium halide gravitationally fed to said screw feeder from said reservoir and extending through a portion of said cylindrical seat means in communication with said reaction chamber such that upon rotation of said screw shaft solid zirconium halide is fed from said reservoir to said chamber; and

a plurality of furnaces surrounding said reaction chamber, said cylindrical seat means and a portion of said vessel, said furnace surrounding said reaction chamber defining a space between said chamber and said furnace wherein a cooling gas may be introduced for cooling said chamber.



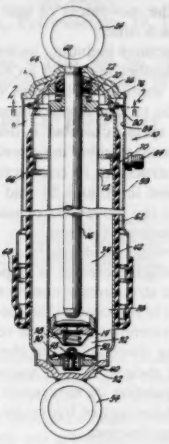
4,105,193

SHOCK ABSORBER AND LEVELING UNIT WITH AUXILIARY DAMPING DEVICE FOR VEHICLE SUSPENSIONS

Paul J. Long, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1976, Ser. No. 744,969
Int. Cl.[2] F16F 9/08
U.S. Cl. 267—64 R **5 Claims**

1. A shock absorbing and height adjusting unit for an automotive vehicle comprising a double acting shock absorber having primary piston means reciprocably mounted in an oil filled pressure cylinder having rebound and compression strokes for damping the ride motions of the vehicle, reservoir means secured to and disposed around said pressure cylinder and providing a space for receiving oil from said pressure cylinder on the compression stroke of said primary piston means, an outer cylinder fixed to said piston means radially spaced from and disposed around said reservoir means, a resilient tubular sleeve operatively connected to said outer cylinder and to said reservoir means providing a pneumatically adjustable gas chamber containing a gas and forming a gas spring for adjusting the curb height of the vehicle body, secondary piston means reciprocably movable in said gas chamber for subdividing said gas chamber into separate sections and for alternately compressing the gas in at least one of said sections in response to the compression stroke of said shock absorber and in another of said sections in response to the rebound stroke of said shock absorber thereby providing auxiliary damping means to supplement the damping action of said primary piston means.

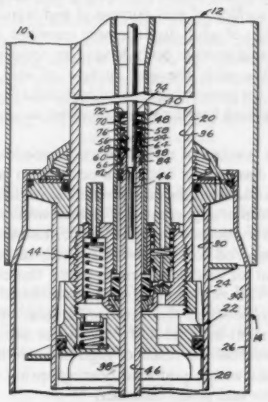


4,105,194

PUMP MECHANISM FOR A COMBINED SELF-LEVELING SHOCK ABSORBER AND FLUID SPRING UNIT

Paul Smeltzer, Napierville; Kris Sharma, Glen Ellyn; David A. Daneck, Elgin, and Sellers B. McNally, Barriington, all of Ill., assignors to Maremont Corporation, Chicago, Ill.

Filed Jun. 1, 1977, Ser. No. 802,312
Int. Cl.[2] F16F 9/34; B60G 17/00
U.S. Cl. 267—64 R **8 Claims**



1. A self-leveling combined shock absorber and fluid spring assist unit adapted to be mounted in place of a conventional shock absorber between the sprung and unsprung masses of a vehicle having a conventional suspension system, said unit comprising:

a pair of tubular structures mounted for longitudinal movement with respect to each other in contracting and extending telescopic relation,

means on the outer ends of said tubular structures for effecting the connection thereof between the sprung and unsprung masses of the vehicle so that said tubular structures

move in contracting telescopic relation in response to the movement of said masses toward one another and said tubular structures move in extending telescopic relation in response to the movement of said masses in a direction away from each other,

said tubular structures including means defining a load bearing spring chamber including an elongated displacement member and annular wall means disposed in telescopic sliding relation to said displacement member so that said load bearing spring chamber is decreased in volume by said displacement member in response to the movement of said tubular structures in contracting telescopic relation and is increased in volume by said displacement member in response to the movement of said tubular structures in extending telescopic relation,

hydraulic fluid within said load bearing spring chamber the pressure of which increases in response to the movement of said tubular structures in contracting telescopic relation and decreases in response to the movement of said tubular structures in extending telescopic relation so as to provide a load bearing force acting on the effective area of said displacement member which varies in accordance with the relative position of movement of said tubular structures and the amount of hydraulic fluid within said load bearing spring chamber,

said displacement member being tubular and having an interior annular surface defining the exterior periphery of a pump chamber and a radially extending end surface communicating with one end of said interior annular surface,

a pump rod disposed in telescoping relation with said tubular displacement member having an exterior annular surface defining the interior periphery of the pump chamber, and

pump valve means between the end surface of said displacement member and the exterior annular surface of said rod for controlling the flow of hydraulic fluid between said pump chamber and said load bearing spring chamber, the improvement which comprises said pump valve means comprising:

an annular body of elastomeric material having an interior annular surface slidably sealingly engaging the exterior annular surface of said pump rod and terminating axially outwardly of said displacement member in a free end surface, said annular body having an opposite end surface engageable with the end surface of said displacement member for preventing flow of hydraulic fluid in direction from said load bearing spring chamber to said pump chamber.

an annular washer of rigid material embedded within said annular elastomeric body in a position to engage the end surface of said displacement member radially inwardly of the position of engagement of said elastomeric body therewith and to slidably engage the exterior annular surface of said pump rod axially inwardly with respect to the engagement of said elastomeric body therewith so as to prevent the extrusion of said elastomeric body axially inwardly between the interior annular surface of said displacement member and the exterior annular surface of said pump rod as a result of high pressure hydraulic fluid conditions within said load bearing spring chamber with respect to said pump chamber,

a rigid tubular element separate from but fixed to the exterior periphery of said displacement member and extending axially outwardly beyond the end surface thereof in surrounding relation to said elastomeric body, said rigid tubular element having an end wall spaced from the free end surface of said elastomeric body centrally apertured to receive said pump rod therethrough, and

a metallic coil spring disposed in surrounding relation to said pump rod between said apertured end wall and the free end surface of said elastomeric body so as to apply a predetermined spring force on said elastomeric body when the latter is disposed with its opposite end surface in engagement with the end surface of said displacement member.

4,105,195

GAS SPRING SUSPENSION SYSTEM FOR A VEHICLE SEAT

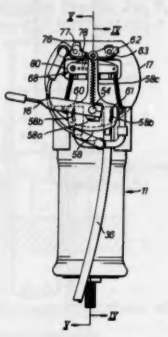
Ervins H. Lamberts, Hartwell, England, assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 21, 1976, Ser. No. 734,587

Claims priority, application United Kingdom, Sep. 10, 1976, 37621/76

Int. Cl.[2] A47C 7/14

U.S. Cl. 267—131 **10 Claims**



1. A suspension system for a vehicle seat of the type comprising a seat part, a base part and guide means for guiding the seat part in upward and downward movement relative to the base part, the system comprising

a gas spring having opposite ends for connection to the base part and to the seat part respectively,

the gas spring being capable of expansion and contraction in a direction between said opposite ends of the gas spring,

valve means communicating with the gas spring and operable selectively to connect the gas spring with a source of compressed gas or with atmosphere in order to expand or contract the gas spring, and

a height adjustment device positioned internally of said gas spring comprising

an abutment member,

a height adjustment mechanism connecting said abutment member to one end of the gas spring,

an up-stop,

a down-stop spaced from said up-stop along the direction of expansion and contraction of the spring,

means securing the up-stop and down-stop to each other and to the other end of the gas spring,

said mechanism being movable between the spaced up-stop and down-stop,

spring means biassing the abutment member towards a predetermined position relative to and between said up-stop and down-stop,

the mechanism comprising two support members slidable relatively to one another along said direction,

one support member having apertures spaced apart therealong, a detent on the other support member for engagement in any selected one of the apertures to lock the support members together,

an operating handle and

means connecting the operating handle to the height adjustment mechanism and to the valve means to release the support members for relative movement therebetween by withdrawing the detent from one of said apertures prior to operation of the valve means.

4,105,196

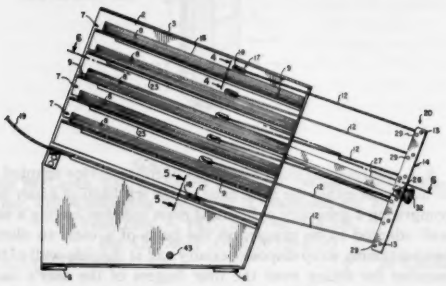
SHEET COLLATOR DEVICE

Raymond H. Van Wagener, Darien, Conn.; Ernest M. Raasch, Fort Lee, N.J., and Elsio J. Loos, Bronx, N.Y., assignors to Swingline Inc., Long Island, N.Y.

Continuation-in-part of Ser. No. 548,471, Feb. 10, 1975, abandoned. This application Feb. 9, 1976, Ser. No. 656,263

Int. Cl.[2] B65H *39/05*

U.S. Cl. 270—58 9 Claims



1. A collator comprising:

(a) a main housing including at least two bins, each of said bins adapted to receive a stack of sheets;

(b) a reciprocating member mounted on said housing for reciprocating movement;

(c) a finger associated with each of said bins and coupled to said reciprocating member for reciprocating movement therewith, each of said fingers being positioned to engage the top sheet of a stack of sheets placed in its associated bin and to move said top sheet from said bin in response to reciprocating movement of said member;

(d) a bracket associated with each of said bins and positioned with respect to said main housing for displacement toward and away from the top sheet on a stack of sheets placed within its associated bin;

(e) first biasing means for biasing each of said brackets toward a position removed from said stack of sheets;

(f) engagement means mounted on each of said brackets for curling the top sheet of a stack upon engagement therewith;

(g) operator means coupled to all of said engagement means for moving said engagement means to curl top sheets;

(h) second biasing means for biasing said engagement means toward a first position with respect to said brackets, said first biasing means being weaker than and yielding before said second biasing means when said first and second biasing means are subjected to a force by the displacement of said operator means;

(i) means for applying a reciprocating motion to said operator means to cause said displacement of said brackets and said operator means;

(j) initial displacement of said brackets and its associated engagement means bringing said engagement means into engagement with a stack of sheets in its associated bin;

(k) further displacement resulting in movement of said operator and said engagement means with respect to said brackets for separating said top sheet from said stack by curling said top sheet.

4,105,197

APPARATUS FOR FOLDING COLLAPSIBLE BOX BLANKS

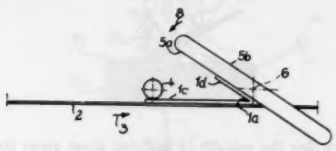
Heinz-Hermann Pott, Pottwiesenstr. 10, D-4904 Enger, Fed. Rep. of Germany

Filed Sep. 9, 1976, Ser. No. 721,747

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1975, 2540649

Int. Cl.[2] B65H *45/14*

U.S. Cl. 270—68 R 2 Claims



1. Apparatus for folding collapsible planar box blanks about fold lines disposed transversely to a feed direction of said blanks, comprising a conveyor for transporting the blanks in said feed direction, at least one elongated folding tool disposed adjacent said conveyor and extending in a direction transverse to said feed direction, said folding tool being mounted to pivot transversely to the conveyor about an axis located above the conveyor, means for moving the conveyor and the folding tool relative to one another to transport a blank toward the folding tool in the said feed direction to cause an edge of said blank to engage and exert a force on said folding tool at a position on said tool between said conveyor and said pivot axis, the force exerted by said blank on said tool being operative to pivot said tool about said axis without the need for a separate driving mechanism to effect such pivoting of the tool, means for restraining the folding tool against pivotal movement until the force applied to the tool by the blank to be folded during feeding of said blank exceeds a predetermined minimum whereby said force causes said folding tool to pivot, the folding tool having a sliding surface facing said edge of said blank and formed as a ramp which rises from the conveyor, said edge of said blank being adapted to slide along said ramp during said folding operation, a depressor positioned adjacent said conveyor for holding down a blank on the conveyor, and means for moving said depressor in a direction substantially parallel to the direction of motion of the conveyor toward and away from the folding tool during said folding operation.

4,105,198

DISPENSER FOR SHEET-LIKE MATERIAL

Emile Frans Stievenart, Hoboken; Hugo Frans Deconinck, Deurne-Zuid, and Willy Gabriel Ceuppens, Borgerhout, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 503,077, Sep. 4, 1974, abandoned, which is a division of Ser. No. 437,701, Jan. 29, 1974, Pat. No. 3,959,654. This application Aug. 11, 1976, Ser. No. 713,492

Claims priority, application United Kingdom, Jan. 30, 1973, 4656/73

Int. Cl.[2] B65H *5/08*

U.S. Cl. 271—14 3 Claims

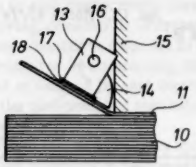
1. An apparatus for dispensing sheets one by one from the top of a pile of sheets comprising:

rockably supported sheet gripping means having means at its lower end for gripping a sheet contacted thereby,

means for moving said sheet gripping means between a delivery position spaced from said sheet pile and a gripping position contacting the top sheet adjacent one margin thereof,

fixed abutment means located adjacent said gripping position, said sheet gripping means having a rigid projection extending laterally from the lower end thereof for engaging said abutment means at the free end thereof,

means for imparting a limited lateral movement away from said sheet margin to the upper part of said sheet gripping means while the latter is in said sheet gripping position and said projection engages said abutment means, whereby said gripping means is caused to rock about the point of contact of said projection and said abutment means to



thereby flex the margin of said top sheet away from the underlying sheet and facilitate separation of the top sheet from said stack when the gripping means moves to said delivery position, and

sheet feeding means for receiving the sheet from said gripping means when the latter is in said delivery position.

4,105,199

PAPER FEEDER COMPRISING A SELECTIVELY DRIVABLE RESILIENT BODY IN FRICTIONAL CONTACT WITH A FEED ROLLER

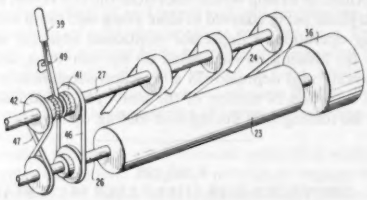
Kazukiyo Sato; Katuo Takahashi; Junjiro Kubota, and Keiji Tsuchiya, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,952

Claims priority, application Japan, Dec. 22, 1975, 50-153016; Oct. 21, 1976, 51-141732[U]

Int. Cl.[2] B65H *3/52*

U.S. Cl. 271—122 **3 Claims**



1. A paper feeder for feeding various types of sheets of paper, one at a time, from a platform to a utilization device, said feeder comprising a feed roller rotatable around a fixed axis, first drive means for driving said roller in a first sense of rotation, a resilient body movable along a circumferential area of said feed roller in frictional contact therewith, second drive means for controllably driving said resilient body when operatively coupled thereto, and manually operable selection means for selectively operably coupling said second drive means and said resilient body in a first state to positively drive said resilient body in a second sense at said area when said sheet is of a predetermined nature and for selectively operably decoupling said second drive means and said resilient body when said sheet of paper is of a different nature, said first sense being a sense of feeding said sheet from said platform to said utilization device, said second sense being a reversed sense, wherein said manually operable means is further operative for selectively operably coupling said second drive means and said resilient body in a second state to positively drive said resilient body in said first sense at said area when said sheet comprises a ground sheet and another sheet attached thereto.

4,105,200

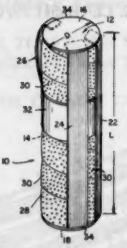
HAND AND FINGER EXERCISE DEVICE

Ann Unger, 140 Cabrini Blvd., New York, N.Y. 10033

Filed Mar. 9, 1977, Ser. No. 775,716

Int. Cl.[2] A63B *21/30*

U.S. Cl. 272—67 **5 Claims**



1. A self-retained hand and finger exercise device adapted to be used with either the right hand or the left hand of a user and comprising a generally cylindrical main member having a side wall adapted to be grasped in the palm of a user, an elastic hand-retaining strap disposed axially and at the side wall of the member for fitting over the four fingers of the user's hand adjacent the knuckles thereof and for maintaining the member in the user's palm as the user flexes his thumb and four fingers away from the side wall, an elastic thumb receiving strap disposed axially and at the side wall of the member for receiving the thumb of the user's hand, said thumb receiving strap exerting pressure on the thumb of the user as the user flexes his thumb away from the side wall and against the elastic action of the thumb receiving strap, and an elastic flexing strap disposed axially and at the side wall of the member for fitting over the four fingers of the user's hand adjacent the fingertips thereof, said flexing strap exerting pressure on the four fingers of the user as the user flexes these fingers outwardly away from the side wall and against the elastic action of the flexing strap, said straps enabling all five fingers of the user's hand to flex outwardly while at the same time retaining the member in the user's palm.

4,105,201

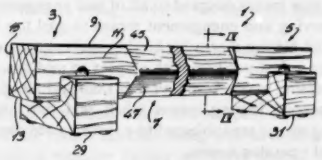
GYMNASTIC BALANCE BEAM

Camille L'Ecuyer, 651 Morin St., St. Jérôme, Quebec, and Laurent Poulin, 630 11[e] rue, St. Georges-Ouest, Quebec, both of Canada

Filed Mar. 9, 1977, Ser. No. 775,790

Int. Cl.[2] A63B *1/00*

U.S. Cl. 272—111 **3 Claims**



1. A gymnastic balance beam which comprises:

(a) an elongate body for horizontal mounting;

(b) said elongate body being terminated at both ends with a portion which is square in cross-section, said portion having four flat faces;

(c) a pair of seats;

(d) each said seat being U-shaped to define a recess adapted to receive both end portions of said elongate body;

(e) said elongate body having a means at both ends to lock the elongate body in a position which is selected by axially rotating said elongated body, said locking means including a bore formed in each said flat face and normal thereto to extend transversely into said elongate body;

(f) a dowel at the bottom of said recess to be inserted into one of said bores to selectively lock said beam in a plurality of positions which are selected by axially rotating said elongate body;

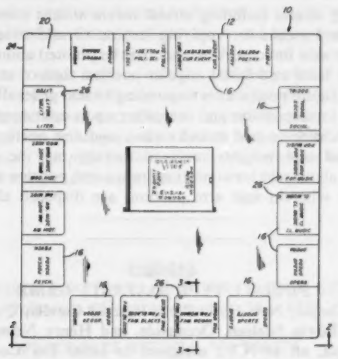
(g) main walking sections intermediate said square portions, said main walking sections having as many different widths of walking surfaces as there are positions which can be selected.

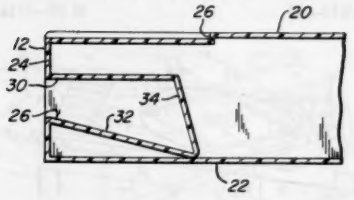
4,105,202

GAME APPARATUS

Keir McLarén, 628 Woodland Ave., and Daniel William Wagner, 419 Washington Ave., both of Oakmont, Pa. 15139

Filed Mar. 4, 1977, Ser. No. 774,336
Int. Cl.[2] A63F *1/00, 1/10, 9/00*
U.S. Cl. 273—309 **10 Claims**





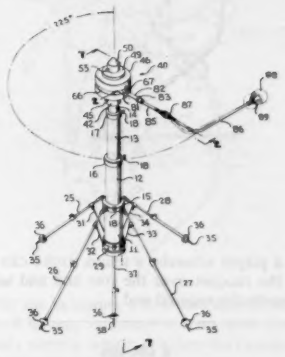
1. A game apparatus comprising: a main body member; a plurality of seating means carried by said body member and adapted to seat subject cards thereon; said seating means extending inwardly with respect to the periphery of said body member and circumferentially spaced therearound; a plurality of card receiving pockets carried by said body member with each of said pockets adapted to loosely receive a plurality of playing cards therewithin at a location no higher than the uppermost surface of said body member; and said pockets extending inwardly with respect to the periphery of said body member, in vertical alignment with respect to respective ones of said seating means and downwardly spaced from said seating means.

4,105,203

TENNIS TRAINER

Tae Han Cho, 19010 Quail Valley Blvd., Gaithersburg, Md. 20760

Filed Jan. 11, 1977, Ser. No. 758,396
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A **7 Claims**



1. Tennis training apparatus comprising:

a free-standing support structure having a vertical axis;

an arm member having first and second sections forming a generally L-shaped structure;

pivotal engagement means securing an end of said first section inside said support structure to permit rotational movement of said arm member about said vertical axis;

bias means in said support structure for biasing said arm member to a rest position and opposing rotational movement of said arm member;

spring means located in said first section of said arm member for imparting axial resiliency to said first section;

holder means located at an end of said second section for firmly holding a tennis ball in a position which is substantially centered with respect to said second section of said arm member;

whereby impact against said tennis ball in a direction axially toward said second section of said arm member is initially partially absorbed by said spring means and then partially absorbed by said bias means;

wherein said pivotal engagement means includes:

a housing having outer side walls, a top wall and a bottom wall forming an enclosure, said outer side walls being positioned to surround said vertical axis and having a horizontally-extending slot defined therein;

a hollow cylinder positioned inside said housing and coaxial with said vertical axis, said hollow cylinder being positioned for rotational movement about said vertical axis; and

means securing said one end of said first section of said arm member to said hollow cylinder such that said first section extends radially outward from said vertical axis through the slot in said outer side walls.

4,105,204

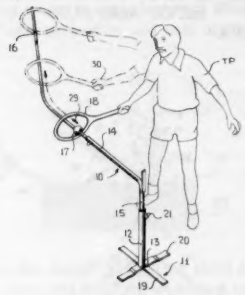
TENNIS STROKE PRACTICE DEVICE

Wilbur V. Koenig, 9891 Good Luck Rd., Lanham, Md. 20801

Filed May 6, 1977, Ser. No. 794,672
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A **8 Claims**

1. A tennis stroke practice device comprised of a base means, a support member positioned thereon and extending substantially vertically upward and a Z-shaped elongated member having one end secured to the upper end of said support member and its other end being free, said free end being disposed upwardly the remaining portion of said Z-shaped member

connecting said free end said secured end and being disposed substantially parallel to a ground surface, and a stringless tennis racquet positioned over said free end and adapted to be

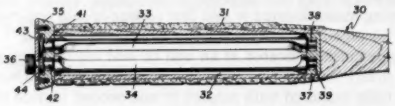


grasped by a player whereby a tennis stroke can be practiced by guiding the racquet over the free end and said remaining portion towards the secured end.

4,105,205
RACKET

Theodore P. Theodores, Sudbury, and Lewis M. Smolin, Marlboro, both of Mass., assignors to Sudbury Engineering Corporation, Sudbury, Mass.

Continuation of Ser. No. 604,238, Aug. 13, 1975, abandoned, which is a continuation of Ser. No. 469,514, May 13, 1974, abandoned. This application Sep. 22, 1976, Ser. No. 725,404
Int. Cl.[2] A63B *49/08*
U.S. Cl. 273—73 J **9 Claims**



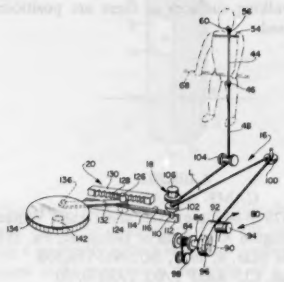
5. A racket, comprising
(a) an elongated handle,
(b) a frame rigidly connected to one end of the handle,
(c) strings tightly mounted in the frame for engagement with a game implement, and
(d) means associated with the handle for radically changing the ability of the handle to bend, wherein the handle is provided with a longitudinally-extending cavity in which the said means is carried and which is provided with a viscous damping fluid, the said means consisting of a beam which has a different bending moment in one plane than in another, the beam having a generally rectangular cross-section, and wherein the handle has a knob located at the other end, which knob is connected to the beam to produce a rotation thereof within the cavity about an axis extending longitudinally of the handle, the beam being contained in a thin metal tube which is sealed for the enclosure of the viscous damping fluid for reducing vibration after impact with a ball.

4,105,206
WEIGHTLIFTING GAME

Steven T. Soulos, 55 Alfred Drowne Rd., Barrington, R.I. 02806

Filed Jan. 27, 1977, Ser. No. 763,228
Int. Cl.[2] A63F *9/00*; A63H *13/04*
U.S. Cl. 273—85 R **24 Claims**

11. A toy including a base, a figure simulating a weightlifter supported by said base, said figure having leg, torso and arm portions interconnected so as to effect simulated weightlifting motions from a rest to a lift position, said leg portions fixedly positioned with respect to said base in a generally upright disposition, said torso pivotally connected to said leg portions at a lower pivot for free arcuate movement with respect thereto from an initial position wherein said torso is angularly disposed with respect to said leg portions to a final position wherein said torso and leg portions are in general upright alignment with each other, said interconnection further comprising in part said arm portions being pivotally mounted to said torso portion at an upper pivot for arcuate movement with respect to said torso, said arm portions having means for receiving weights, means for elevating said figure, said figure

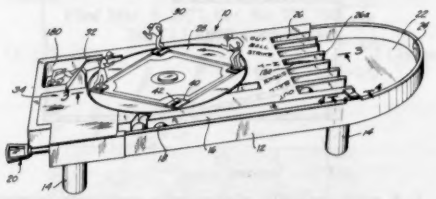


elevating means including strand means means connected to said strand means for applying tension to said strand means whereby said torso portion may first be pivoted about said leg portions from said initial angular position thereof to an intermediate figure position corresponding to said generally aligned leg and torso position and thereafter upon continued application of tension to said strand means, said arm portions of said body and said weights received thereby may be arcuately pivoted about said torso portion from a rest position to said lift position wherein said arm portions are disposed above said torso.

4,105,207
PINBALL TYPE BASEBALL GAME

Julius Cooper, New Hyde Park; Vincent Carella, Queens Village; Edwin Nielsen, Oceanside, and Henry Nemeth, Massapequa, all of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,277
Int. Cl.[2] A63F *7/06*
U.S. Cl. 273—89 **14 Claims**



7. A pinball type baseball game comprising, a frame having a ball guide track formed therein and a plurality of ball receiving pockets communicating with said track; a plurality of balls, and selectively operable means for projecting individual balls along the track towards said pockets for random entrance therein; a play surface rotatably mounted on said frame and simulating a baseball diamond; a plurality of figurines adapted to be selectively and removably mounted on said play surface at predetermined locations thereon representing the bases of said diamond; drive means in said frame for rotating said play surface, and releasable stop means operatively associated with one of said pockets for normally holding said playing surface

against rotation by said drive means and for releasing said play surface for limited rotation by said drive means through an arc of varying lengths and of one revolution or less according to a predetermined and apparently random pattern in response to entrance of a ball into said one pocket; said drive means including a one way spring clutch rotatably mounted in the frame and having an output member drivingly engaged with the play surface, and means for energizing the spring of the clutch while the play surface is held against rotation by said stop means; said releasable stop means including an annular surface on said play surface having a plurality of recesses formed therein arcuately spaced from one another by 90°, a spring lever pivotally mounted in said plane having one end engaged with said annular surface and one end located in said one pocket in position to be engaged by a ball falling into the pocket and pivoted in response to engagement by the ball to move said one end thereof away from said annular surface, and means for normally biasing said one end of the lever against said surface for movement into a recess therein when a recess is moved in juxtaposition with the lever during rotation of the play surface, whereby engagement of the lever in said one pocket by a ball will release the engagement of the lever and recess in said annular surface to allow the play surface to be driven by the spring clutch; said stop means including a program cam rotatably mounted in said frame and drivingly engaged with said play surface to be rotated by the play surface when the play surface is rotated by the spring clutch; said cam having a plurality of cam protuberances and being located in the frame in a position adjacent said lever and wherein the protuberances align, in plan, with the periphery of said annular surface thereby to block the recesses which move into juxtaposition with the lever according to a predetermined pattern which produces an apparently random sequence of angular movements of the play surface of one revolution or less each time a ball enters said one pocket.

4,105,208

INDOOR FOOTBALL (SOCCER) MATCH SET

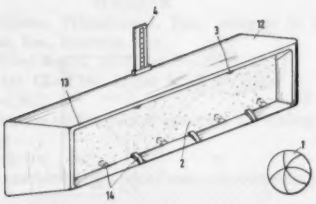
Antonius Polhuis, Oldenkotterstrasse 56, 4426 Vreden, Germany

Filed Feb. 15, 1977, Ser. No. 768,774

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606607

Int. Cl.[2] A63F *63/04, 71/04, 71/06*

U.S. Cl. 273—95 R **6 Claims**



1. An indoor football (soccer) match set comprising:
at least one goal;
a ball of such size as to be able to enter said goal;
a movable plate positioned within said goal;
a bar having numbered marker panels disposed one above the other, said bar having a plurality of teeth arranged one above the other; and
latch element means having latches for engaging said teeth, and having a cam engaging the rear face of said plate, said bar and said latch element means being positioned so that said bar moves downward by one marker panel with every impact of said ball against said plate.

4,105,209

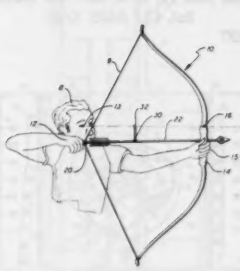
ARROW MOUNTED SELF-RETRACTING SIGHT

David Bizzéll, 7 Benjamin Hill Rd., Newfield, N.Y. 14867, and Eino A. Makarainen, 400 Comfort Rd., Ithaca, N.Y. 14850

Filed Jun. 17, 1977, Ser. No. 807,561

Int. Cl.[2] F41B *5/02*

U.S. Cl. 273—106.5 R **5 Claims**



1. A sight for use in aiming a bow and arrow, comprising;
an arrow shaft having curvature in transverse cross section;
a curved body portion which matches the curvature of said shaft in transverse cross section
means pivotally connecting said body portion to said shaft of said arrow to permit said body portion to pivot from an upright, aiming position to a folded position along said shaft when said arrow is in flight.

4,105,210

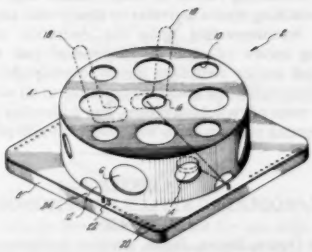
HOCKEY GAME APPARATUS

Lawrence T. Jones, Manhattan Beach, Calif., and William Jacobs, Edwardsville, Ill., assignors to California R & D Center, Culver City, Calif.

Filed Jan. 9, 1976, Ser. No. 647,923

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—126 R **13 Claims**



1. A hockey game apparatus for two or more players comprising:
a game projectile;
at least a pair of striking members for propelling the game projectile;
a totally planar playing surface for supporting the projectile during the game; and
a hollow shell housing having a top portion and a side member enclosing the playing surface, the top portion having a first plurality of apertures for permitting ingress and egress of the striking members through a player selected aperture to move the game projectile across the playing surface, the side member having a second plurality of apertures, some of the side member apertures being positioned above the playing surface and permitting ingress and egress of the striking members while others of the side member apertures are immediately adjacent the periphery of the playing surface and form goal positions on the

housing for receiving the game projectile to provide a score by a player.

4,105,211

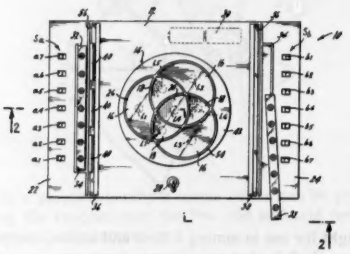
GAME OF LOGIC

Fred E. Wernig, 65 Cherry St., Massapequa, N.Y. 11758

Filed Jun. 11, 1976, Ser. No. 695,010

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—237 **10 Claims**



1. A game of logic for a plurality of players comprising: a first and second interdependent control console, means visually isolating said first and second control console from each other, each of said consoles including a multiplicity of switching means, each of said switching means including a single pole-double throw control element operatively connected to a corresponding switching means on said other console forming a multiplicity of interdependent pairs of switching means, an energy source, means connecting said energy source to all of said interdependent pairs of switching means, a responsive device formed in the shape of three intersecting circles and defining a multiplicity of on-off indicating segments having a corresponding activatable responsive element at each said segment and corresponding to the number of interdependent pairs of switching means, each of said activatable responsive elements responsively coupled to one of said interdependent pairs of switching means in such manner that operation of either switching means activates or deactivates said responsive element interdepending upon the operation of the other switching means of each interdependent pair of switching means and master switching means interruptably connecting said means connecting said energy source to all of said interdependent pairs of switching means, and a plurality of individual play directing playing cards mountable on said playing board.

4,105,212

REPRODUCING STYLUS FOR PHONOGRAPH RECORDS

Junshiro Ogura, Tokyo, Japan, assignor to Ogura Jewel Industry Co., Ltd., Japan

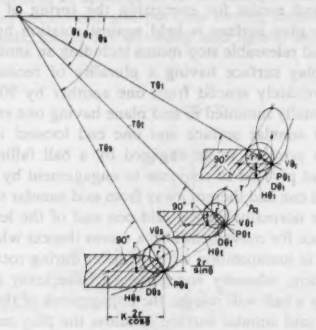
Filed Sep. 20, 1976, Ser. No. 724,757

Claims priority, application Japan, Sep. 23, 1975, 50-114324

Int. Cl.[2] G11B *3/44*

U.S. Cl. 274—38 **11 Claims**

1. A reproducing stylus for phonograph records having an operative tip portion, with a central axis substantially perpendicular to the direction of travel along a sound groove of a record, said tip portion being formed, on lower and laterally opposite surfaces of the stylus, with arcuate edges designed to contact the walls of a sound groove in a record disk, said operative tip portion having a substantially elliptical cross-section elongated perpendicular to the direction of travel of the stylus along a sound groove; the groove-contacting portions of said operative tip portions following a curved contour line, in a section taken in a plane perpendicular to such direction of travel and including the central axis of said stylus and passing through the stylus tip, which is an arc of a circle having a center of curvature Q located in said plane; the arcuate edges of said operative tip portion tangent to and centered on said contour line, in all sections Dθ thereof in a plane Tθ, including any point Pθ thereof on said curved contour line and including said center of curvature Q, and which plane Tθ is perpendicular to a plane including said point Pθ and said central axis of said stylus, being portions of identical ellipses; the projections of said arcuate edges in said plane Tθ, projected, perpendicular



to said plane Tθ, onto a plane Hθ perpendicular to said central axis of said stylus, forming part of respective ellipses having the same minor diameter and whose major diameter is

$$k \cdot (2r/\cos\theta)$$

where θ is the angle formed by said planes Tθ and Hθ, said minor diameter is $2r$, and $k \geqq 1.0$.

4,105,213

DEVICE FOR CUTTING A SOUND GROOVE ON A DISC RECORDING MEDIUM

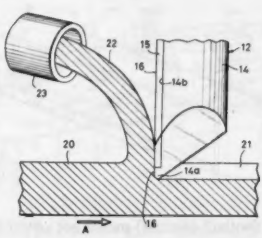
Isao Owaki; Shinji Nakamura, and Yoshiyuki Tsuchikane, all of Tokyo, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 5, 1976, Ser. No. 729,669

Claims priority, application Japan, Oct. 15, 1975, 50-139372[U]; Jan. 29, 1976, 51-9069[U]

Int. Cl.[2] G11B *3/44*

U.S. Cl. 274—38 **5 Claims**



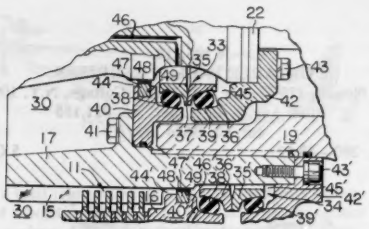
1. A device for cutting a sound groove on a disc recording medium comprising a diamond stylus body having a part for cutting a groove on said disc recording medium, thereby producing a chip cut from said disc recording medium, and nonconductive means made of a material which does not readily generate static electricity so that it does not readily generate static electricity when said chip is in sliding contact therewith, said nonconductive means being mounted on a mirror cutting surface of said stylus body at a position where it makes contact with said chip.

4,105,214

SEALING ARRANGEMENT FOR BRAKE HOUSING

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 15, 1974, Ser. No. 524,115
Int. Cl.[2] F16J *15/34*
U.S. Cl. 277—74 **16 Claims**



1. In a rotary drive mechanism having means defining a chamber in which the mechanism is disposed, said chamber having an inlet and an outlet for providing a flow of lubricating coolant through the chamber for cooling the mechanism therein, and sealing structure having an annular face seal defined by a pair of yieldingly engaging seal rings and resilient biasing element sealingly closing said chamber, the improvement comprising: divider means including a buffer seal dividing said chamber into a main portion receiving said mechanism and an outlet portion confronting said face seal, said divider means having a passage therethrough for conducting pressurized lubricating coolant fluid from said chamber main portion to said chamber outlet portion for cooling and lubricating said face seal, said passage having flow restricting means for providing a preselected pressure regulating flow restriction of the coolant fluid from said chamber main portion to said chamber outlet portion; and means defining a discharge passage from said chamber outlet portion, whereby fluid is flowed from said inlet through said chamber main portion to said outlet and concurrently through said flow restricting passage to said chamber outlet portion and from said chamber outlet portion to said discharge passage for maintaining concurrently a preselected cooling of said mechanism and a preselected lubrication and cooling of said face seal.

4,105,215

WELL PACKER INCLUDING COMBINATION ANTI-EXTRUSION AND SEGMENT RING ACTUATING WASHER

Lloyd C. Rathburn, Friendswood, Tex., assignor to Loomis International, Inc., Houston, Tex.

Filed Sep. 6, 1977, Ser. No. 830,613
Int. Cl.[2] F16L *21/04*; E21B *33/128*
U.S. Cl. 277—116.2 **5 Claims**

1. In combination with a packer assembly for sealing a well pipe, including

an upper unit,

a tool stem carried by the upper unit and depending therefrom,

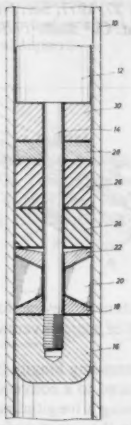
a lower unit connected to the tool stem, and

a packer unit positioned on the tool stem between said upper and lower units, said upper unit operably connected to move toward said lower unit, thereby applying pressure to the packer unit,

the improvement in a packer unit which comprises

a washer surrounding the tool stem having inward and outward conical surfaces, said washer having sufficient hardness to maintain shape integrity without breaking under packer pressure;

a resilient packer section having a surface adjacent the inward conical surface of said washer, which packer surface, in the absence of applied packer pressure, is closer at its outer dimension to said inward conical surface than elsewhere, applied packer pressure thereby causing said resilient packer section to tend to extrude along said inward conical surface; and



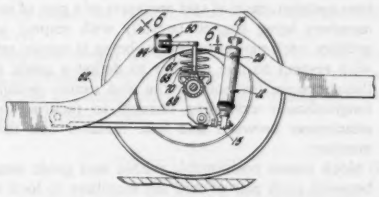
a radially expanding segmented packer ring, the outward conical surface of said washer abutting an inward conical surface of said packer ring.

4,105,216

MOTOR VEHICLE LEVEL CONTROL CIRCUIT

Donald E. Graham, Centerville, and Paul J. Long, Jr., Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 635,258, Nov. 25, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,271
Int. Cl.[2] B60G *17/00*
U.S. Cl. 280—6 R **5 Claims**



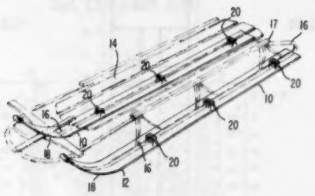
3. A motor vehicle level control circuit for use with motor vehicle leveling systems of the type operative to level the sprung mass of the motor vehicle within a predetermined trim band in response to respective electrical signals indicating the sprung mass to be above and below the trim band comprising: and optical coupler arrangement of the type including a pair of light sources and a pair of photosensitive signal generating devices, each optically coupled to a respective one of said pair of light sources for producing a first logic signal pair when the sprung mass is above the trim band, a second other logic signal pair when the sprung mass is below the trim band and a third other logic signal pair when the sprung mass is within the trim band; first circuit means responsive to said first logic signal pair for producing a sprung mass high signal; second circuit means responsive to said second logic signal pair for producing a sprung mass low signal; delay circuit means effective to inhibit the production of both said sprung mass high and sprung mass low signals for a predetermined time duration; means responsive to said sprung mass high signal for effecting the lowering of said sprung mass; and means responsive to said sprung mass low signal for effecting the raising of said sprung mass.

4,105,217

SKI-SLED ATTACHMENT DEVICE

Victor Metelow, 72 Rutgers Ave., and Ivan Tirenin, 36 Fourth Ave. White Head Rd., both of Trenton, N.J. 08619

Filed May 27, 1977, Ser. No. 801,190
Int. Cl.[2] B62B *17/02*
U.S. Cl. 280—28 11 Claims



11. A ski-sled attachment device for use secured to the bottom of the runners of the conventional snow sled which comprises:

(a) a base member extending longitudinally to be adapted to be detachably secured to a conventional sled runner, said base member defining a longitudinally extending channel centrally located in the upper surface thereof to facilitate firm securement of a sled runner thereto, said base member further including a forward section adapted to be sucured to the front portion of a sled runner, said front section defining a plurality of laterally extending channels in the upper surface thereof to facilitate upward flexing of said front section;

(b) a plurality of adjustable locking means positioned along the upper surface of said base member to detachably secure said base member to a conventional sled runner, said locking means comprising:

(1) a plurality of pairs of tab members extending upwardly from the upper surface of said base member, each of said locking means including a pair of said tab members, each of said tab members defining an aperture therethrough in a transverse direction with respect to said base member, each of said apertures of a pair of said tab members being aligned laterally with respect to one another, each pair of tab means being in spaced relation with respect to one another to define a guide means therebetween for holding the sled runner within said longitudinally extending channel to facilitate a firm attachment between said base member and the sled member;

(2) block means positionable within said guide means in between each pair of said tab members to lock a sled runner in place within said guide means, said block means defining an elongated hole means laterally therethrough being alignable with respect to said apertures, said elongated hole means oriented angularly with respect to said base member to allow adjustment in the vertical distance from said base member to said block means, said block means also defining a groove means in the lower surface thereof to snugly mate with the upwardly extending section of a conventional sled runner to facilitate securement thereof within said guide means; and

(3) bolt means selectively locatable through said hole means and said apertures of a pair of tab members to firmly hold said block means against a sled runner with said guide means;

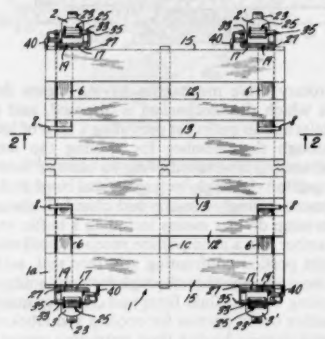
(c) two laterally spaced and forwardly extending arms at opposite lateral sides of the forward edge of said base member, said arms defining an opening therebetween and being adapted to flex upwardly to be positionable above the sled upper rail allowing the rail to pass through said opening, said arms defining orifices therethrough and including a stud means adapted for placement through said orifices to hold said arms in locked position above the sled upper rail.

4,105,218

PORTABLE PALLET CARRIERS

George Newell, 119 Helene Rd., Valley Cottage, N.Y. 10989

Filed Aug. 2, 1977, Ser. No. 821,155
Int. Cl. B62d *21/18*
U.S. Cl. 280—43.12 5 Claims

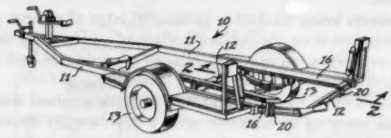


1. A portable pallet carrier comprising; an elongated, rigid support arm having a free end insertable into a pallet underlying the platform crosspieces thereof and having means on said support arm for releasably attaching the support arm to the pallet for raising and lowering the pallet as said support arm is raised and lowered; means for raising and lowering the support arm comprising a guide fixed on an end of said arm defining a guide slot normal to the longitudinal axis of said support arm and extending on opposite sides of said axis, a caster mount extending from said arm in a direction corresponding to an axial direction thereof, a caster wheel on said caster mount, a guide plate fixed to said caster mount for movement in said guide slot in opposite directions corresponding to an upward and a downward direction of movement of the caster mount, a pivot plate fixed relative to the support arm and spaced from said caster mount, an operating linkage for moving the caster mount and its guide plate guided in said slot in opposite directions, said operating linkage constituting an operating handle having an end pivoted on said pivot plate and a free end portion operable in opposite directions to two separate operative positions disposed on opposite sides of the longitudinal axis of the support plate, one operative position constituting a raised position of the handle corresponding to a lowered position of the support arm and the other operative position constituting a lowered position of the handle corresponding to a raised position of the support arm, a connecting link having a pivot connected to said handle intermediate a free end thereof and the pivoted end of the handle, a pivot pivotally connecting the connecting link to said caster mount, the pivot connected to said handle pivotally rotating about the pivot at the end of said handle as said handle is actuated, the pivots being relatively disposed for converting arcuate movement of the pivot on the handle about the pivot on the end of the handle to develop force components applied through said connecting link effective in a plane parallel to said slot for moving said caster mount to a raised and a lowered position thereby to lower and raise the support arm.

4,105,219
POSITIVE LOCKING DEVICE FOR BOAT TRAILER BOLSTER BRACKET

Fred B. Gerson, c/o Hub City Machine & Tool Co., 408 Sterling St., Jackson, Tenn. 38301

Filed Apr. 11, 1977, Ser. No. 786,654
Int. Cl.[2] B60P 3/10
U.S. Cl. 280—789 2 Claims



1. In a boat trailer having a transverse channel frame member, and a bolster having a top boat-supporting surface and a bottom surface, a bolster mounting device comprising:

(a) an elongated support member having a plate portion substantially longer than the height of said transverse frame member, and having a top portion and a bottom portion,

(b) means attaching the top portion of said support member to the bottom surface of said bolster,

(c) an elongated slot extending through the longitudinal central portion of said plate portion and having a length substantially greater than the height of said transverse member,

(d) a U-bolt member encompassing a cross-sectional portion of the transverse frame member, having threaded end portions extending through said elongated slot, and including nuts engaging said threaded end portions and adapted to be tightened against said plate portion,

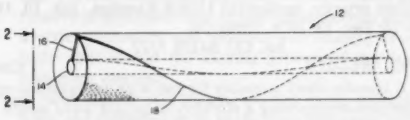
(e) a plurality of vertically spaced locking holes in said plate portion, various holes of which are located in a locking position adjacent and above a flange on said transverse frame member for various vertically adjusted positions of said support member relative to said transverse frame member, and

(f) a stop pin member inserted through one of said locking holes in a locking position in which said pin member rests upon the top surface of a flange of said transverse frame member.

4,105,220
IMPACT PROTECTION PAD

William L. Pacific, Somerville, Mass., assignor to Rogers Foam Corporation, Somerville, Mass.

Continuation of Ser. No. 613,063, Sep. 15, 1975, abandoned. This application Mar. 11, 1977, Ser. No. 776,931
Int. Cl.[2] B62J 23/00, 27/00
U.S. Cl. 280—289 E 3 Claims

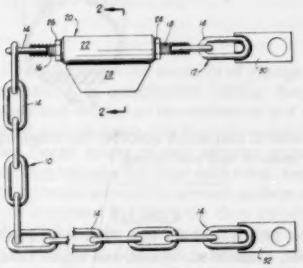


1. An impact protection pad for mounting on a vehicular handle bar of uniform circular cross section, said pad in the unmounted and unstressed state, comprising a unitary, generally cylindrical body of uniform composition comprising flexible closed cellular plastic material, said body being radially deformable upon impact and being solid except for an axial hole and a single slit both extending from end to end thereof, the hole having a substantially smaller diameter than said body, the outer periphery of the undistorted slit lying in a substantially helical line around the surface of said body and the configuration of the undistorted slit in any cross section of said body being a substantially straight line extending between said helical line and said hole, said body having sufficient resiliency to permit the slit to be opened for wrapping on to a handle bar of substantially the same diameter as said hole and sufficient stiffness to resist distortion and removal from said handle bar without added peripheral support.

4,105,221
TENSIONING LINKAGE

Ancel H. Fleming, 3715 N. Tulsa, Oklahoma City, Okla. 73112

Filed Feb. 4, 1977, Ser. No. 765,533
Int. Cl.[2] B60D 1/00
U.S. Cl. 280—461 A 5 Claims



1. A tensioning linkage comprising:

a pair of elongated flexible elements;

a turnbuckle sleeve;

means threadedly connecting an end of each of said flexible elements to an end of said turnbuckle sleeve; and

a weight connected to said turnbuckle sleeve and projecting from one side thereof for opposing rotation of the turnbuckle sleeve about its longitudinal axis in a direction which causes the flexible elements to unthread from the sleeve;

wherein said weight is a trapezoidally shaped plate projecting from said sleeve in a plane containing said longitudinal axis and facilitating manual rotation of said sleeve about said longitudinal axis.

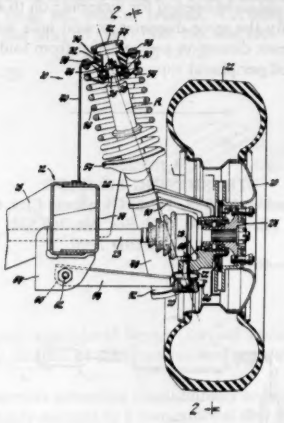
4,105,222
INDEPENDENT FRONT SUSPENSION SYSTEM

Robert M. Buchwald, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1976, Ser. No. 745,126
Int. Cl.[2] B60G 11/56
U.S. Cl. 280—668 5 Claims

1. An independent suspension system for a front wheel drive motor vehicle having a supporting frame and a road wheel and tire, said system comprising a laterally extending control arm having its inner end pivotally connected to said frame; a steering knuckle pivotally connected to the outer end of said control arm for rotatably supporting said wheel; a shock absorber having its lower end connected to said steering knuckle and its axis inclined with respect to a vertical transverse plane at a predetermined angle for anti-dive and anti-lift characteristics, and its upper end pivotally connected to said frame forward of its lower end at a point which together with the center of the pivotal connection between the steering knuckle and the control arm defines a predetermined steering axis; a coil spring mounted around said shock absorber, the upper end thereof

being concentric with said shock absorber and the lower end thereof being eccentric with said shock absorber; and retainer



means secured to said shock absorber for retaining said upper and lower ends of said coil spring.

4,105,223

INSTRUMENT PANEL FOR A VEHICLE

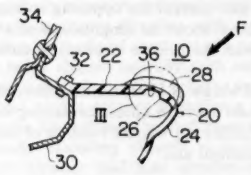
Takaaki Oda, Musashi-murayama, and Kazuo Takeuchi, Chiba, both of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Sep. 28, 1976, Ser. No. 727,572

Claims priority, application Japan, Oct. 31, 1975, 50/148787[U]

Int. Cl.[2] B60K *37/00*; B60R *21/04*

U.S. Cl. 280—752 **5 Claims**



1. A safety instrument panel for a vehicle, comprising:

an elongated sheet member laterally set at a front section of a passenger compartment of said vehicle;

means for weakening the resistance to deformation of areas of said elongated sheet member and comprising a plurality of recesses having relatively substantial surface area formed in said elongated sheet member, said areas being most likely impacted by the passenger's head during a vehicle collision; and

padding secured to outer surfaces of said enlongated sheet member so as to cover said areas.

4,105,224

NOTE PAD ASSEMBLY

Helen D. Rodebaugh, 1539 B Lafayette Dr., Columbus, Ohio 43220, and William C. Fowler, 226 E. Dunedin Rd., Columbus, Ohio 43214

Filed Jun. 23, 1977, Ser. No. 809,291

Int. Cl.[2] B42D *5/00*; B43C *3/00*

U.S. Cl. 281—15 R **10 Claims**

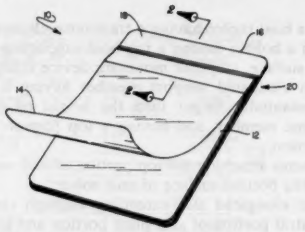
1. An assemblage of paper sheets suited for recording written information thereon and a subsequent adhesive posting thereof wherein they are utilized progressively from uppermost first to lowermost last, comprising:

a backing sheet having a generally rectangular configuration of predetermined width and height and selected having a given paper stock density;

a plurality of said sheets, each having a generally rectangular configuration, one edge dimension of which is less than the said predetermined width or height of said backing sheet;

said sheets being stacked in substantial edge alignment and positioned upon the upward surface of said backing sheet in an orientation exposing at least a portion of said upwardly disposed backing sheet surface;

discrete lengths of poylmeric tape of predetermined width, each carrying an adhesive upon a downwardly disposed



surface thereof, each said discrete length of tape being prestressed and affixed to and over an extent of about one half said tape predetermined width to an associated said sheet in the vicinity of one edge thereof, said tape having a portion protruding over such edge;

said protruding portion of said length of tape which is affixed to said last sheet being adhesively affixed to said backing sheet exposed regions; and

the said protruding portion of each successive said length of tape and associated said sheet being adhesively affixed to the upwardly disposed surface of an adjacent lower disposed said length of tape protruding portion so as to provide composite laminar assemblage of said prestressed lengths of tape protruding portions, each retaining an associated said sheet from first to last in aligned, stacked adjacency upon said backing sheet.

4,105,225

AUTOGRAPHIC REGISTER SYSTEMS

David John Neale, Waltham Cross, and Victor Herbert Perriman, London, both of England, assignors to Moore Business Forms Inc., Niagara Falls, N.Y.

Continuation of Ser. No. 538,040, Jan. 2, 1975, abandoned. This application Aug. 8, 1975, Ser. No. 603,094

Claims priority, application United Kingdom, Jan. 10, 1974, 1194/74; Dec. 13, 1974, 53901/74

Int. Cl.[2] B41M *5/22*

U.S. Cl. 282—27.5 **2 Claims**

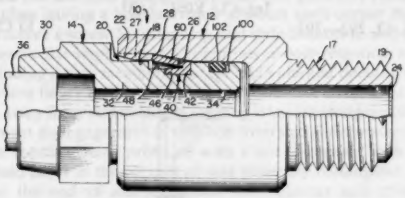
1. A transfer sheet assembly for use in an autographic register assembly comprising a plurality of record webs which are adapted to be fed through an autographic register and transfer sheets alternately interleaved with the record webs in the autographic register wherein the transfer sheets each comprise a base sheet selected from paper having a barrier coating and plastics film, a porous solvent coated coating on the base sheet, said porous solvent coated coating including cellulose acetate butyrate resin and polymethyl methacrylate resin and a colourless colour former within the porous coating including para toluene sulphinate of Michler's Hydrol in castor oil and wherein the record webs carry a colour developing coating for selectively developing the colour former in the porous coating.

4,105,226

SNAP-IN FITTINGS AND COUPLING RING THEREFOR

William J. Frey, and Paul L. Meyer, both of Louisville, Ky., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 691,756, Jun. 1, 1976, abandoned. This application Jan. 28, 1977, Ser. No. 763,588
Int. Cl.[2] F16L *39/00*
U.S. Cl. 285—175 17 Claims



1. A coupling ring for use in snap-in fittings of the type including male and female connector elements, the male connector element including a ring-retaining channel and the female connector element including a locking groove, said coupling ring comprising:

an annular base portion including an annular axially extending outer wall, an annular axially extending inner wall spaced radially inwardly from said outer wall, and an annular radial end wall interconnecting adjacent ends of said inner and outer walls;

an annular collar portion integral with said base portion and extending from a side of said base portion opposite said end wall, said collar portion including an annular, generally frustoconical outer wall and an annular axially extending inner wall spaced radially therefrom;

said inner wall of said collar portion being contiguous with said inner wall of said base portion;

said inner wall of said collar portion being adapted to seat in the retaining channel of the male connector element;

said outer wall of said collar portion being disposed radially inwardly of the plane of said outer wall of said base portion and converging toward said inner wall of said collar portion in a direction away from said base portion; and

an annular locking portion integral with said base portion and extending from a side thereof opposite said end wall, said locking portion being of longer length than said collar portion and including: an annular generally frustoconical outer wall, an annular generally frustoconical inner wall spaced radially therefrom, and an annular, radial terminal wall interconnecting said inner and outer walls of said locking portion;

said inner wall of said locking portion extending from said base portion toward said terminal wall at an acute angle relative to said outer wall of said collar portion to form a vertex therewith, said terminal wall adapted to lockingly abut within the locking groove of the female connector element;

said outer wall of said locking portion being contiguous with, and extending at an angle from, said outer wall of said base portion and being divergent relative to said inner wall of said locking portion in a direction away from said base portion;

said vertex being disposed closer to said end wall of said base portion than is the place of intersection of said outer walls of said base and locking portions;

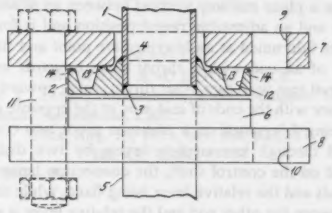
said locking portion including a plurality of circumferentially spaced resiliency slots extending therethrough, one of said slots extending completely through the ring to facilitate mounting thereof on the male connector element.

4,105,227

FLANGE JOINT BETWEEN PIPE LENGTHS

Sven Erik Ekberg, and Ove Leonard Ekberg, both of 891 23 Själevad, Sweden

Filed May 11, 1977, Ser. No. 795,883
Int. Cl.[2] F16L *23/00*
U.S. Cl. 285—412 2 Claims



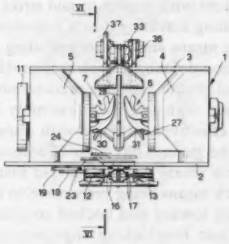
1. A flange joint for use in the assembly of pipings from pipe elements, comprising in combination sealing flange means mounted around and welded to the outermost end portion of each of adjacent pipe elements, the front faces and back faces of said sealing flange means of said adjacent pipe elements opposing and being turned away from each other, respectively, there being two annular concentric contact surfaces on each of said back faces separated by relatively deep circular groove means in said back faces, the radially outer one of said concentric contact surfaces being depressed in relation to the radially inner one, clamping flange means slidably mounted on each of said pipe elements and capable of engaging said concentric contact surfaces, said clamping flange means extending beyond the circumference of said sealing flange means and having a number of holes in the thusextending part thereof, and bolt and nut means received in the holes of said clamping flange means of said adjacent pipe elements for clamping said clamping flange means together thereby causing a conical deflection thereof to engage said radially outer as well as said radially inner annular concentric contact surfaces of said sealing flange means for achieving an essentially equalized distribution of pressure on said radially inner and outer annular contact surfaces and for securing efficient sealing between the opposing front faces of said sealing flange means.

4,105,228

AUTOMATIC KNOT-FORMING MACHINE FOR THE FORMATION OF THE FISHERMAN'S KNOT

Pietro Messa, Salo' (Brescia), Italy, assignor to Mesdan S.p.A, Salo' (Brescia), Italy

Filed Nov. 1, 1977, Ser. No. 847,487
Claims priority, application Italy, Nov. 3, 1976, 29017 A/76
Int. Cl.[2] A01D *59/04*
U.S. Cl. 289—2 4 Claims



1. An automatic knot-forming machine for the formation of the fisherman's knot, particularly for coarse-count yarns and

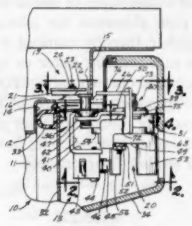
intended to be mounted on an automatic spooler, comprising latching members for the yarns to be knotted, thread-crossing members, confrontingly mounted rotary hooks equipped with scissors for severing and holding the tails of the threads and an extractor and tensioning member for the knot, said members of latching, crossing and extractor member being controlled by cams mounted on a control shaft, characterized in that the extractor member is arranged oscillably between the rotary hooks on a plane midway vertical between an at rest lowered position and an adjustable raised position and is formed by a flat lever fulcrumed at an intermediate point and fitted in the vicinity of an end with a throat open upwards and with a transversal arm with two other throats open upwards in correspondence with the ends of said arm, at the opposite end of said lever being fulcrumed on a common pivot two control rods actuated through intermediate levers by two distinct cams mounted on the control shaft, the connection between one of these rods and the relative lever being fixed, while the connection between the other rod and the relative lever is adjustable, said cams being intended to control in two successive stages the lift of the extractor from the resting position to the raised position.

4,105,229

LATCH MECHANISM FOR APPLIANCE

Henry J. Kaldenberg, Des Moines, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Nov. 3, 1977, Ser. No. 848,104
Int. Cl.[2] E05C 5/00
U.S. Cl. 292—113 **11 Claims**



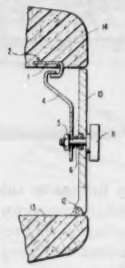
1. A latch mechanism for an appliance having a cabinet and an access door movable between an open and a closed position, the combination comprising: strike means on one of said cabinet and said access door; latch mounting means on the other of said cabinet and said access door; and a latch assembly on said latch mounting means and operable between latched and unlatched conditions with respect to said strike means, said latch assembly including actuating means movably mounted on said latch mounting means and further including catch means having a first portion defining a hook engageable with said strike means, a second portion spaced a predetermined distance from said first portion with said latch assembly in said unlatched condition and effectively retained with respect to said actuating means in the general direction of access door movement, and displaceable means connecting said first and second portions, said catch means being responsive to movement of said actuating means toward said latched condition for movement of said hook into interlocking engagement with said strike means and then for movement of said displaceable means and said hook to change said predetermined distance and effect a drawing of said access door toward said cabinet and a latching of said access door in said closed position.

4,105,230

CLOSURE FOR PIVOTAL FLAPS, COVERS, OR THE LIKE

Rolf Amann, Renningen; Hans Benda, Aidlingen, and Albert Dietterle, Böblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 3, 1976, Ser. No. 663,565
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1975, 2509299
Int. Cl.[2] E05C 5/00
U.S. Cl. 292—202 **13 Claims**



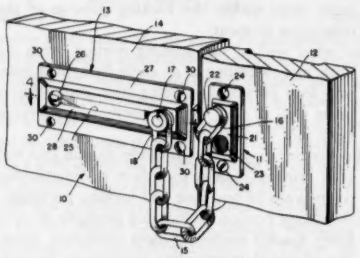
1. A lock for a pivotal member, the lock comprising a curved locking member cooperating with a free end in a locking position with a free end of a fixed locking member, characterized in that the cooperating free ends of the two locking members have an approximately rectangularly bent configuration and effect upon a displacement of the pivotal member to a locking position a substantially horizontal and a substantially vertical interengagement in such a manner that a mutual support in the horizontal and vertical directions precludes a disengagement of the free ends of the locking members either in an upward direction with respect to the fixed locking member or in an opening direction of the pivotal member, the curved locking member engages with a bent-off free end with the free end of the fixed locking member from behind the fixed locking member, the curved locking member is rotatably supported at a pivotal part against the force of a spring normally urging said curved locking member into the locking position, and in that at least one of the two locking members includes an inclined slide surface means along a lateral edge thereof which cooperates with an adjacent lateral edge of the other of the two locking members so as to enable a locking of the two locking members by a simple pressing closed of the pivotal member.

4,105,231

CHAIN LOCK ASSEMBLY

Phillip H. Huyssen, 116 Baber St., Hot Springs, Ark. 71901

Filed May 20, 1976, Ser. No. 688,153
Int. Cl.[2] E05C 17/36
U.S. Cl. 292—264 **2 Claims**



1. A chain lock assembly for securing a door in a partially

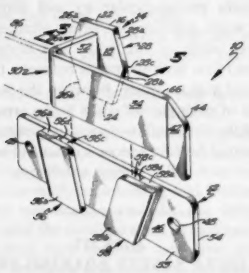
open position including a keeper bracket for attachment to a door frame, a chain having one end secured to said keeper bracket, a bolt connected to the other end of said chain, and a slide bracket for attachment to said door having an elongated slot for slidably receiving said bolt with said elongated slot having an enlarged opening in one end thereof to facilitate introducing said bolt into said elongated slot, said slide bracket further having a generally rectangular plate with a longitudinally extending upstanding portion terminating in said elongated slot and said enlarged opening, said generally rectangular plate having a hole provided adjacent each corner thereof to receive a screw for attaching said slide bracket to said door, wherein the improvement comprises a bolt retention means including a base member adjacent said enlarged opening and a resilient finger member integral with said base member extending away from said enlarged opening into said elongated slot to prevent disengagement of said bolt from said slide bracket, said base member being provided with a slot to register with each of said holes in the corners of said generally rectangular plate near the end of said elongated slot adjacent said enlarged opening to receive said screws for attaching said bolt retention means to said door.

4,105,232

CORNER-RETAINING LATCH APPARATUS FOR DOORS

Howard J. Miels, R.R. #2, Brook Park, Minn. 55007

Filed Jun. 10, 1977, Ser. No. 805,425
Int. Cl.[2] E05C *19/18*
U.S. Cl. 292—288 **4 Claims**



1. A corner retaining latch apparatus mountable on a door frame for retaining a corner of a door comprising:

a keeper including a tongue and rigid door engaging strap fixed to and extending outwardly from and laterally of said tongue, said strap including door corner retaining means for closely confronting and encompassing a corner of the door to engage the corner and arrest movement of the door toward said strap; and

a mounting bracket having an outer face and attachable to the door frame adjacent the door and including tongue retaining means to removably support said tongue in a rest position on said mounting bracket, wherein said door corner retaining means encompasses the corner of the door;

said tongue retaining means including first and second spaced apart, converging guideways fixed to said mounting bracket to slidably receive and support said tongue of said keeper, each said guideway including:

a flat spacer fixed to said outer face of said mounting bracket and extending outwardly from said outer face a distance exceeding the thickness of said tongue; and

a guide plate fixed to and overlying said spacer to cooperate with said spacer and said outer face of said mounting bracket to define a track along which said tongue is slidably receivable and in which said tongue is retained when in rest position; and

said tongue being flat and movable within said tracks from said rest position to a camming position, wherein the plane of said flat tongue becomes transverse to said outer face of said mounting bracket with said tongue camming between said spacers, a said guide plate and said outer face of

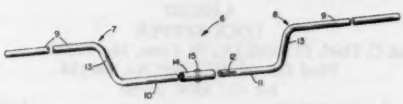
said mounting bracket in response to force applied to said strap by said door being forced outwardly, thereby frictionally retaining said tongue in said tracks and resisting dislodgment of said tongue from said guide-means.

4,105,233

WINDOW AND DOOR LOCK

Virginius T. Levey, Sacramento, Calif., assignor to Ida M. Thompson, Sacramento, Calif.

Filed Aug. 10, 1977, Ser. No. 823,267
Int. Cl.[2] E05C *17/54*
U.S. Cl. 292—288 **5 Claims**



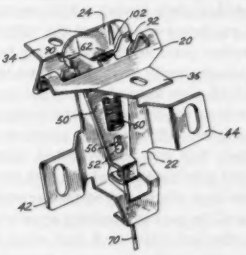
1. In combination with a closure including a horizontally elongated upright rectangular frame of inwardly opening channel-shape cross section having upright closure panels mounted therein for horizontal sliding movement toward and away from one another and a stationary panel mounted on and secured to an outer side of said frame intermediate of its ends and combining with said sliding panels for completely closing the frame when the sliding panels are located in the ends of the frame; a lock for said sliding panels comprising two rods having corresponding outer end portions engaging in top portions of the frame and resting on upper edges of said sliding panels, said rod portions having outer ends abutting the ends of the frame and being of a length somewhat greater than the horizontal length of the sliding panels, said rods having downwardly extending intermediate portions and horizontally extending inner end portions, said inner end portions terminating in slightly spaced apart relation to one another, and means retaining said inner end portions in alignment with one another to prevent any appreciable sliding movement of the rods toward one another, said intermediate portions defining stops for limiting movement of said sliding closures toward one another.

4,105,234

LATCH MECHANISM

Ray Eberhart, 317 E. Jefferson Blvd., Mishawaka, Ind. 46544

Filed Apr. 29, 1977, Ser. No. 792,198
Int. Cl.[2] E05C *13/02*
U.S. Cl. 292—302 **10 Claims**



1. A latch mechanism comprising a female portion having a means defining a slot with two opposed edges and a shoulder

on the inner side of the slot, a male portion having a first member with a forward end movable into and from said slot and a shoulder thereon for engaging and interlocking with said first mentioned shoulder, and a second member connected to said first member and being movable toward and away from the forward end of said first member and into and from said slot when said first member is disposed therein and said shoulders are in engagement with one another, and means movable with said second member for disengaging said shoulders from one another when said second member is withdrawn from said slot.

4,105,235

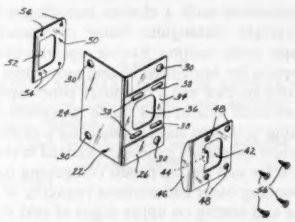
LOCK KEEPER

Frank C. Thiel, 17 Biritz Dr., St. Louis, Mo. 63137

Filed Jun. 20, 1977, Ser. No. 808,184

Int. Cl.[2] E05C *21/00*

U.S. Cl. 292—341.18 **13 Claims**



1. A lock keeper for receiving the bolt of a mortise-type lock, said keeper comprising: an angle bracket configured to fit on a door frame and including a side leg and a front leg which are positioned at a right angle with respect to each other and are joined together at a right angle corner, the angle bracket being generally unobstructed at the inside of the corner so as to be capable of fitting against a strike jamb of a door frame with the corner of the bracket being adjacent to the edge of the door frame, the side leg having a depression opening outwardly therefrom away from the front leg with the depression extending all the way to the corner and having spaced apart margins which are substantially perpendicular to the corner, the side leg also having a bolt-receiving aperture in the depression thereof, with the aperture being configured to receive a lock bolt, the side leg further having screw-receiving apertures in the depression thereof; a striker plate fitted into the depression and being capable of sliding therein generally parallel to the margins of the depression when not secured to the angle bracket, the striker plate having a bolt aperture which aligns with the bolt-receiving aperture of the side leg on the angle bracket, the striker plate further projecting beyond the corner where it turns backwardly toward the front leg so as to form a beveled lip; a lock plate located against the opposite face of the side leg and behind the depression and being configured so as not to obstruct the bolt-receiving aperture of the side leg, whereby a lock bolt can be projected completely through striker plate and side leg and past the lock plate without interfering with the lock plate; and screws extending through the striker plate and the screw-receiving apertures in the side leg and engaging the lock plate such that when loose, the striker plate is free to slide in the depression, but when tightened the striker is clamped down tightly against the side leg and will not move, whereby it is possible to adjust the position of the bolt aperture with respect to the angle bracket.

4,105,236

SHOCK ABSORBING BODY

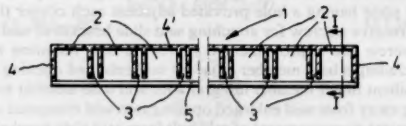
Richard Haar, Brunswick, Germany, assignor to Volkswagenwerk Aktiengellschaft, Wolfsburg, Germany

Filed May 28, 1975, Ser. No. 581,676

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1974, 2433137

Int. Cl.[2] B60R *19/08*

U.S. Cl. 293—71 R **5 Claims**



1. A shock absorber for an object to be protected, for example a shock-absorbing automobile bumper, comprising:

an elongated plane rigid support means; and

an elongated deformable body having outer, upper, lower and side walls connected together to form a box-like structure open on one side, said body being attached to said support means and having a hollow region in its interior which is open toward the support means, the outer wall of said body, which faces said support means, being provided with a flexible high tensile strength belt for transmitting shear forces to the material of the deformable body, said deformable body having pairs of walls as part of and extending from its outer wall in a direction substantially perpendicular to said support means, the pairs of walls additionally being attached to said upper and lower walls of the body and dividing the hollow region into first hollow spaces between the pairs of walls and second hollow spaces between the walls of each pair, the walls of each pair of walls being arranged so that the width of the first hollow spaces is greater than the width of the second hollow spaces so that the walls of each pair can brace each other during a collision.

4,105,237

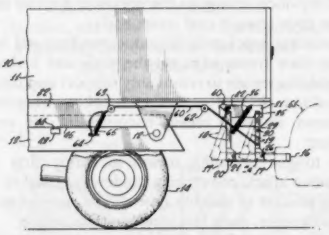
VEHICLE SAFETY BRAKING SYSTEM

Charles S. Viall, Sr., 1150D S. State College Blvd., Anaheim, Calif. 92806; Charles S. Viall, Jr., 3401 Gaviota, Long Beach, Calif. 90008, and Harold S. Viall, 938 S. Chancer, Anaheim, Calif. 92806

Filed Jan. 2, 1976, Ser. No. 646,287

Int. Cl.[2] B60R *19/02*

U.S. Cl. 293—73 **14 Claims**



1. In combination with a vehicle having a chassis, a body, and pivot means pivotally connecting said body to said chassis for dumping a load in said body by movement of the rearward portion of said body downwardly and the forward portion of said body upwardly, said vehicle having brakes, a safety device for said vehicle comprising

a bumper assembly including an impact member adapted to

engage an obstruction, and link means pivotally connecting said impact member to said body,

means responsive to engagement of said impact member with an obstruction for applying said brakes, and means for retracting said bumper assembly upon said movement of said body,

said retracting means including cable means attached to said bumper assembly and to said chassis for pulling upwardly relative to said body on said assembly upon said movement of said body.

4,105,238

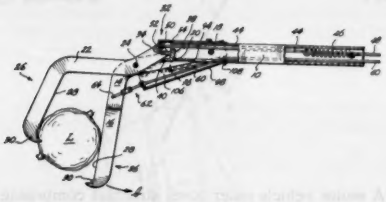
ARTICLE HANDLING IMPLEMENT

Robert R. Stright, Village Plaza, Bainbridge, Wash. 98110

Filed Jan. 17, 1977, Ser. No. 759,766

Int. Cl.[2] A47J *49/14*

U.S. Cl. 294—11 **8 Claims**



1. Article handling apparatus for manipulating a fire log or the like, comprising:

a. opposed outer and inner jaw means;

b. a pivotal interconnection between said jaw means;

c. elongate handle means having a load end and an actuating end;

d. a pivotal interconnection between said inner jaw means and said handle means near said load end;

e. broken back linkage means interconnecting said outer jaw means and said handle means and situated between said pivotal interconnections; and

f. spring means normally maintaining said broken back linkage means in non-broken attitude, the tension of said spring means and the configuration of said outer and inner jaw means being such that the said jaws are relatively open and said linkage is non-broken in the absence of a log or like substantial weight between said jaws, and said jaws are maintained relatively closed and said linkage is maintained broken by the weight of a log or the like being retained by said jaws.

4,105,239

MAGNETIC TOOL

Joseph J. Akczinski, Sr., 317 Shipley Ave., Glen Burnie, Md. 21061

Filed Mar. 24, 1977, Ser. No. 780,773

Int. Cl.[2] F16C *11/04*

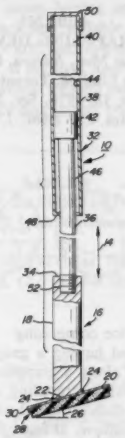
U.S. Cl. 294—65.5 **5 Claims**

1. A magnetic tool for releasably securing metallic members thereto, comprising:

(a) first handle means adapted to be gripped in one hand of a user, said first handle means having a first rod member extendable in a longitudinal direction and a plate member secured to said lower end of said first rod member, said plate member forming a predetermined acute angle with said first rod member extension, said magnetic means being secured to said plate member;

(b) magnetic means secured to a lower end of said first handle means; and

(c) telescoping handle means releasably insertable within an upper end of said first handle means, said telescoping handle means having a second rod member releasably insertable within an upper end of said first rod member and a longitudinally extended tubular member having a passage for slidable insert of said second rod member, said passage having an extended diameter terminal end for



insert of a spring snap element adapted to be compressed on insert within an upper portion of said passage and to expand within said terminal end for securement therein.

4,105,240

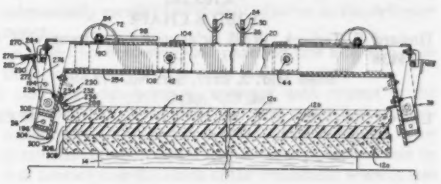
LIFTING DEVICE FOR LARGE PANELS

Thomas W. Steenson, Richmon Hill, and W. Donald Paton, Aurora, both of Canada, assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed Jul. 26, 1977, Ser. No. 819,118

Int. Cl.[2] B66C *1/30*

U.S. Cl. 294—81 R **10 Claims**



1. A lifting device for lifting large panels comprising:

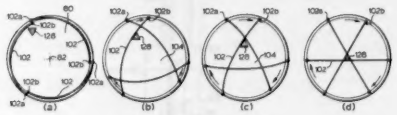
a main beam;

a pair of gripping jaws each connected at one end of said main beam and each including a gripping jaw frame pivotally connected to said main beam, said gripping jaws each being adapted to assume a repose position spaced from a panel to be lifted and a working position adjacent such panel;

positioning means for positioning each gripping jaw frame with respect to said main beam to establish a desired angular relationship between said each gripping jaw frame and said main beam, said positioning means including guide means on said each gripping jaw frame, gripping jaw frame moving means engaged with said guide means, and a manually operable means pivotally connected to said main beam and eccentrically connected to said frame moving means to eccentrically move said frame moving means with respect to said guide means upon operation of said manually operable means whereby said each gripping jaw is moved between said repose and working positions; and

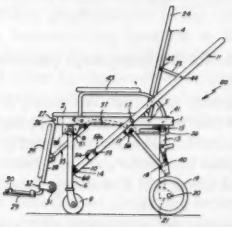
supporting means pivotally mounted on said frame for supporting a panel.

4,105,241
GRAPPLING DEVICE
Francis Herbert Arthur Mee, Aurora, Canada, assignor to Spar Aerospace Products Limited, Toronto, Canada
Filed Oct. 15, 1976, Ser. No. 732,815
Int. Cl.[2] B66C *1/10*
U.S. Cl. 294—86 R **26 Claims**



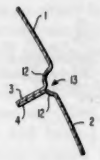
1. A grappling device comprising
(a) a grappling head having a grappling window opening inwardly thereof along a grappling axis,
(b) at least two flexible grappling cables of a fixed length having opposite ends mounted on said grappling head at the grappling window, at least one end of each of said grappling cables being movable relative to said grappling head in the plane of said grappling window between a first position in which said grappling cables are taut and extend across the grappling window at uniformly spaced circumferential intervals to intersect one another and to provide a grappling aperture therebetween within which a component may be securely located with respect to said head by engagement with said grappling cables and a second position in which the grappling aperture is substantially enlarged without increasing the length of the grappling cables to admit a component thereto, and
(c) drive means mounted on the grappling head for moving the grappling cables between said first and second positions.

4,105,242
MOBILE CHAIR
Howard G. Terbeek, 19258 Briarwood La., Strongsville, Ohio 44136
Filed Mar. 2, 1977, Ser. No. 773,601
Int. Cl.[2] A61G *1/02*
U.S. Cl. 296—20 **19 Claims**



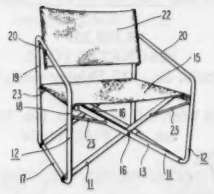
1. A cart convertible between a chair position and a bed position of reduced vertical height with respect to the chair position; said cart including first and second movable supporting legs downwardly depending when the cart is in the chair position and in a retracted position when the cart is in the bed position; said first leg being positionable in said retracted position when said second leg is positioned in said downwardly depending position; said cart including an occupant support portion positionable to function as the back when the cart is in the chair position and to be in a retracted supporting position when the cart is in the bed position; said cart including a first adjustment means coupling said occupant support portion and said first leg for simultaneously moving said first leg and said occupant support portion toward the retracted positions of said first leg and said occupant support portion.

4,105,243
OUTER BODY PANEL STRUCTURE FOR VEHICLE BODIES
Friedrich Geiger, Boblingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 233,104, Mar. 9, 1972, abandoned. This application Feb. 7, 1975, Ser. No. 548,005
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1971, 2111876
Int. Cl.[2] B62D *25/02*
U.S. Cl. 296—28 R **22 Claims**



1. A motor vehicle outer cover structure comprising a plurality of motor vehicle outer body panel means, each of said outer body panel means including a first portion and an angularly extending portion terminating in an inwardly directed edge portion, the inwardly directed edge portions of adjacent body panel means being arranged in abutting relationship with the angularly extending portions to define an intentionally visible separating place of a predetermined profile, said edge portions are directed inwardly approximately at a right angle and abut against one another, and said angularly extending portion includes grooves pressed-in diagonally with respect to the outer body panel means to form said predetermined profile.

4,105,244
FOLDABLE FURNITURE UNIT
Donald Bruce Colby, Los Angeles, Calif., assignor to Brown Jordan Company, Philadelphia, Pa.
Filed Apr. 12, 1977, Ser. No. 786,888
Int. Cl.[2] A47C *4/28*
U.S. Cl. 297—45 **3 Claims**



1. In a foldable furniture unit, a pair of upright side frames each having at least one leg portion, a pair of inclined cross frames pivotally connected intermediate their ends, each cross frame having its lower region pivotally connected to a lower region of a side frame, each cross frame including at its upper end a seat rail extending front to rear of the unit, a flexible seat having its side edges secured to the seat rails of said cross frames, the arrangement being such that when the unit is unfolded for use said seat rails are respectively in close proximity to said leg portions of said side frames and when the unit is folded for storage said seat rails are disposed above the uppermost regions of said leg portions of said side frames, said seat rails having therein longitudinal cavities reduced width access

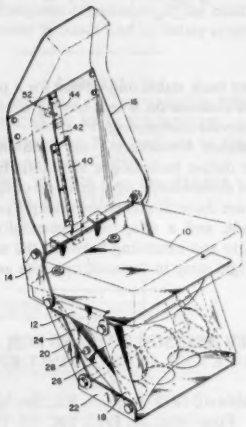
slots thereto, said seat at its side edges being provided with welts disposed in said rail cavities, a removable core disposed in each welt for preventing withdrawal of the welts through said slots, and at least one cap member on an end of each seat rail, said cap members constituting at least a partial closure for ends of said rail cavities, and at least one cap member on each seat rail having a restraining member projecting therefrom and extending closely adjacent a side frame leg portion when the unit is unfolded, said restraining members limiting fore and aft movement of said seat rails relative said side frames.

4,105,245

FORWARD, STOWABLE SEAT AND BACK

Wayne K. Simons, Federal Way, and Donald J. Teodoro, Seattle, both of Wash., assignors to Paccar Inc., Bellevue, Wash.

Filed Oct. 22, 1976, Ser. No. 735,091
Int. Cl.[2] B60N *1/02*
U.S. Cl. 280—65 R **5 Claims**



1. A forward, stowable seat and back for the driving compartment of an automotive truck cab of the type having a forward driving compartment and a rearward sleeper compartment, including a seat, a back and a base supporting the seat and back in the driving compartment, the improvement comprising:

said base including a seat frame, a floor frame, forward and rearward upright frames pivotally mounted between the seat and floor frames for pivotal fore and aft movement of the seat and back, brace means for supporting the upright frames in their aft position with the seat and back suspended substantially rearwardly of the floor frame, and releasible latch means for holding the upright frames in the rearward position against forward or rearward movement, said upright frames when unlatched being swingable into said forward position with said seat and back being moved substantially forward of the rearward end of said floor frame whereby an occupant can stand in the compartment in the place formerly occupied by the seat and back when in the aft position, said brace means including a set of upper and lower links pivotally mounted together at overlapping ends, the lower link being pivotally mounted to a forward end of the floor frame, the upper link being pivotally mounted at a rearward end of the seat frame whereby rearward movement of the upright frames is precluded beyond said rearward position by the links but forward movement is allowed by pivoting of the links forwardly.

4. A forward, stowable seat and back having a seat frame and a pivotally mounted back for an automotive truck driver's compartment, the improvement comprising:

a single flexible locking strap rigidly secured at its lower end to said seat frame,

a slide track extending vertically along said back,

said flexible locking strap having an upper end slidably received in said track and slidable therealong when the back is pivoted forward, said lower end resiliently bending when said back is pivoted, and

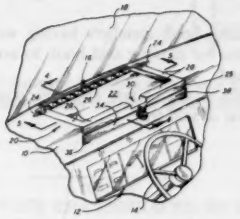
detent means for releasibly locking said strap against movement in said track for precluding pivotal movement of the back.

4,105,246

MULTI-PURPOSE DASHBOARD ATTACHMENT

Gerald M. Trumbull, 522 Irish Settlement Rd., Freeville, N.Y. 13068

Filed Jun. 20, 1977, Ser. No. 808,105
Int. Cl.[2] B60J *3/00*
U.S. Cl. 296—97 E **9 Claims**



1. A multi-purpose unit for mounting upon the top of an automobile dashboard having an elongated defroster outlet adjacent the lower edge of the windshield forwardly of the steering wheel, said unit comprising, in combination:

(a) an essentially rectangular, planar panel member;

(b) hinge means mounting said panel for movement between first and second positions relative to the dashboard and windshield about an axis through one edge of said panel substantially parallel and closely adjacent to the defroster outlet;

(c) a raised lip bordering said panel on one side along the three edges thereof other than said one edge;

(d) said one edge being so arranged with respect to the dashboard and windshield that said panel lies approximately parallel to the top surface of the dashboard when in said first position and at least a major portion of said lip is in contact with the inside of the windshield when in said second position; and

(e) means defining at least one air outlet passage in said lip, whereby air from the defroster outlet is discharged into the space between the windshield and said panel when the latter is in said second position and exits from said space through said air outlet passage.

4,105,247

HIGH CHAIR WITH TRAY FASTENING

David Saint, Elverson, Pa., assignor to Graco Metal Products, Inc., Elverson, Pa.

Filed Mar. 9, 1977, Ser. No. 775,890
Int. Cl.[2] A47B *39/00*
U.S. Cl. 297—149 **5 Claims**

3. In combination with a chair having closed tubular arms and a tray for detachable connection to said arms,

the means for detachably connecting said tray which comprises

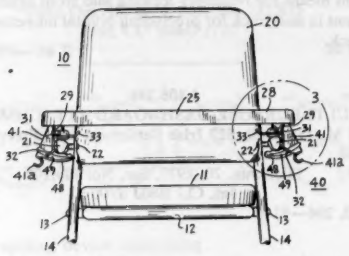
horizontally spaced mounting brackets carried by said tray and open from below for positioning on each of said arms,

locking hook members pivotally mounted on each of said

brackets on horizontal pivots parallel to said arms and each having

an operating handle portion for moving said hook members to release positions, and

a hook for swinging movement to different engaging positions beneath said arms.



said locking hook members having weight distribution effective for moving said hook to arm engaging position, and

said hooks in any of said engaging positions preventing removal of said tray.

4,105,248

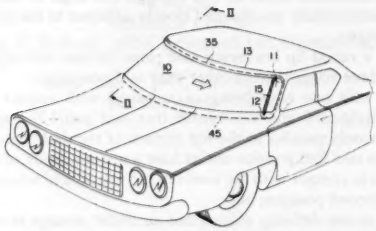
SAFETY WINDSHIELD

Timothy R. Lake, Walnut Creek, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jun. 29, 1976, Ser. No. 700,869

Int. Cl.[2] B60J *1/20*

U.S. Cl. 296—84 H **1 Claim**



1. A windshield for a vehicle formed of a continuous sheet of transparent flexible plastic wound in a closed loop about a pair of spaced rollers, in which

one of said roller is fitted with power means to rotate the roller, and in which

the edges of the sheet are enclosed by flexible gaskets in a frame bounding the windshield, with

a fixed wiper blade mounted externally to the frame of the windshield and located to wipe the external surface of the forward sheet of the windshield sheet, as the sheet is wound by the rollers, said wiper blade and said rollers each mounted along substantially vertical axes, with said wiper blade located externally about the mid-section of the windshield sheet, so as to wipe the forward sheet of the windshield as it is drawn past the wiper blade, together with

washer pump and spray means associated with said wiper blade to wash the forward sheet as it is drawn past the wiper blade.

4,105,249

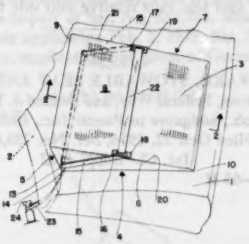
LOWER BACK STABILIZING DEVICE

Rutherford Van Vliet, Jr., Staten Island, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 28, 1977, Ser. No. 763,704

Int. Cl.[2] A47C *7/02*

U.S. Cl. 297—230 **5 Claims**



1. A lower back stabilizing device for a person seated on an independent cushion on a seat having a back rest, said back stabilizing device comprising

anchor means for securing the cushion to the seat, said anchor means including a substantially square U-shaped strap of substantially rigid material coupled to the cushion in one are thereof, said strap having a pair of spaced opposite ends, and a strap of substantially flexible material affixed to and extending between the ends of the substantially rigid strap in a spaced opposite area of said cushion.

4,105,250

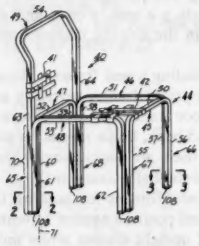
CLUSTER ASSEMBLY MEANS FOR ARTICLES OF FURNITURE AND ARTICLES INCORPORATING THE SAME

John W. Caldwell, 1829 Warwick Rd., San Marino, Calif. 91108

Filed Mar. 28, 1977, Ser. No. 781,850

Int. Cl.[2] A47C *1/12*

U.S. Cl. 297—445 **18 Claims**



1. Cluster assembly means for an article of furniture comprising: a plurality of rigid support elements, each having a straight portion with an axis, an inside cavity, an inner wall bounding at least part of said cavity, a slot opening onto said outer wall and into said cavity, said inner wall being adjacent to at least one edge of the slot and spaced from that part of the outer wall adjacent to the slot by a reference dimension, said slot having a dimension of width; and a straight joinder member having an axis, an axially extending web, and an axially extending flange, one at each edge of the web and projecting laterally beyond said web, the flanges having a dimension of thickness greater than the width of the slot, the web having a dimension of thickness no greater than the width of the slot and a width not less than twice the reference dimension, each flange being disposed in a respective one of said cavities with its respective

flange bearing against the respective inner wall and with its web passing through the respective slot, whereby the support elements are held in a cluster with the joinder member holding them against lateral separation from one another.

4,105,251

DISPERSION OF CATALYSTS WITH EXPLOSIVES FOR IN SITU MINING OF CARBONACEOUS MINERALS

William F. Wolff, Park Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 29, 1977, Ser. No. 820,100

Int. Cl.² E21B *43/24, 43/26;* E21C *41/10*

U.S. Cl. 299—2 **21 Claims**

1. A process for the generation of synthetic fuels from rigid or solid carbonaceous mineral deposits, such as oil shale and coal, by using an in situ mining technique to promote the conversion of hydrocarbons to a more desirable product, which comprises: using explosives to fracture and rubblize the mineral and disperse a catalyst into said mineral in such a manner that the subsequent conversion of the catalyst coated particles to recoverable product can be better controlled.

4,105,252

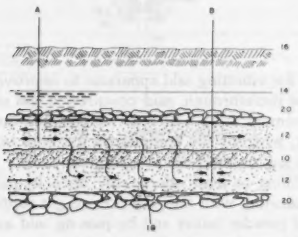
SOLUTION MINING OF MINERALS FROM VERTICALLY SPACED ZONES

Thomas F. Moore, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 20, 1976, Ser. No. 752,058

Int. Cl.² E21B *43/28*

U.S. Cl. 299—4 **8 Claims**



1. An improved method for the solution mining of a mineral from a subterranean formation containing same in a zone of low permeability have a zone of higher permeability both above and below it in which an injection and production well are drilled and completed, leach solution is injected through said injection well into said formation to dissolve said mineral, and said dissolved mineral is recovered via said production well, wherein the improvement comprises locating one of said wells in one high permeability zone and the other of said wells in the other high permeability zone to establish a potential difference between said high permeability zones and thereby apply a vertical component of flow of said leach solution to said zone of low permeability facilitating the recovery of said mineral present therein.

4,105,253

PROCESS FOR RECOVERY OF MINERAL VALUES FROM UNDERGROUND FORMATIONS

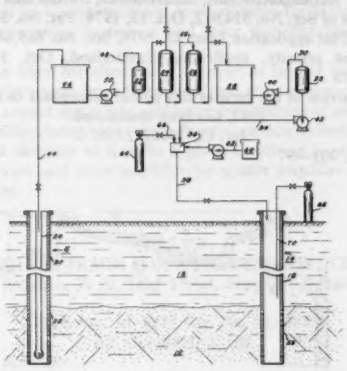
William E. Showalter, Seal Beach, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Feb. 11, 1977, Ser. No. 767,788

Int. Cl.² E21B *43/28*

U.S. Cl. 299—4 **25 Claims**

1. In a method for the solution mining of a substance which in an oxidized state is soluble in an aqueous leaching solution, said method comprising the steps of (1) introducing an oxidant and an aqueous leaching solution into a subterranean deposit containing said substance, thereby to solubilize said substance in situ to form a pregnant liquor, (2) recovering said pregnant liquor from said deposit, and (3) separating said substance from said pregnant liquor, the improvement comprising:



utilizing as said aqueous leaching solution a solution comprising a dilute aqueous carbonic acid solution and said oxidant.

4,105,254

WHEEL WITH RIM EMBRACED BY TIRE

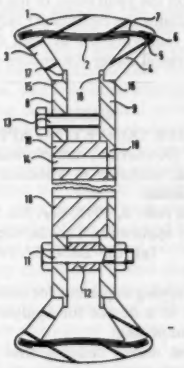
Michael Raymond Corner, Coventry, and William Lewis Jackson, Sutton Coldfield, both of England, assignors to Dunlop Limited, London, England

Filed Jul. 30, 1976, Ser. No. 710,311

Claims priority, application United Kingdom, Aug. 8, 1975, 33137/75

Int. Cl.² B60B *3/08*

U.S. Cl. 301—63 DS **7 Claims**

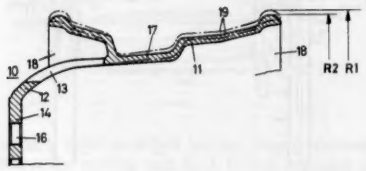


1. A wheel comprising a central disc portion adapted for attachment to a vehicle, a pair of substantially continuous circumferentially and substantially axially extending tire bead seating surfaces which face radially outwardly, one for each of a pair of continuous beads of the two sidewalls of a tire, a pair of radially outwardly projecting bead locating flanges axially inboard of said seating surfaces, with each flange being adjacent to the inboard edge of a continuous bead of a tire when mounted on the wheel, said seating surfaces and said flanges being the only means retaining the tire bead to the wheel and means to force at least said flanges away from each other after a tire has been mounted with its beads on said seating surfaces, to permit the beads to be forced axially apart while they remain on said seating surfaces.

4,105,255
CAST ONE-PIECE ANNULAR RIM MEMBER FOR A VEHICLE WHEEL

Hans Kopp, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Division of Ser. No. 514,912, Oct. 15, 1974, Pat. No. 3,964,144.
This application Mar. 23, 1976, Ser. No. 669,489
Claims priority, application Switzerland, Oct. 16, 1973, 14612/73
The portion of the term of this patent subsequent to Jun. 22, 1992, has been disclaimed.
Int. Cl.[2] B60B *21/02*
U.S. Cl. 301—97 6 Claims



1. An annular rim member for use in a vehicle wheel equipped with a pneumatic tire and, in particular, a tubeless tire, said annular rim being formed by the process comprising the steps of forming a mold cavity for the rim member with at least one of a radial over dimension and a radial under dimension of an amount other than the customary excess dimension provided for shrinkage or as a processing allowance, at least over an annular portion of the rim cross-section and with the outer surface of the rim member arranged to face the tire having a unitary annular area, pouring nodular cast iron melt into the mold cavity for forming the rim member with a ductile structure, removing the cast rim member from the mold cavity and radially plastic cold working the solidified cast rim member for plastically deforming the rim member during which plastic deformation the yield point of the cast ductile structure is exceeded and attains the established radial dimensions of the rim member for removing the at least one of a radial over dimension and a radial under dimension.

4,105,256
POWDER CONVEYING APPARATUS

Peter R. Parker, Downsview, and Norman G. Allen, Toronto, both of Canada, assignors to Volstatic of Canada Limited, Mississauga, Canada

Filed Nov. 4, 1976, Ser. No. 739,012
Claims priority, application Canada, Sep. 9, 1976, 260843
Int. Cl.[2] B65G *53/14*
U.S. Cl. 302—51 9 Claims

1. Powder conveying apparatus for conveying powder paint from a container to a device for applying the powder paint, said apparatus comprising:

first and second means defining first and second vertical powder flow passages, respectively,

in vertical axial alignment with the second powder flow passage positioned above the first powder flow passage;

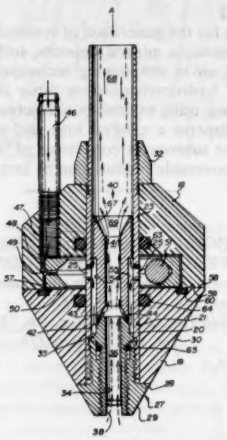
said first and second means forming first and second flow constrictors, respectively, and being axially spaced apart from one another to define an annular gap between opposed ends of said flow constrictors;

a powder inlet opening communicating with the first powder flow passage at the lowermost end of said first flow constrictor, wherein said powder inlet opening is provided at the underside of said apparatus and in axial alignment with said first and second powder flow passages;

a vertical powder outlet passage communicating with the second powder flow passage at the uppermost end of said second flow constrictor, whereby said powder inlet opening, said first and second flow passages and said powder outlet passage provide a straight-through vertical flow path;

a compressed gas supply passage communicating with said annular gap for supplying compressed gas through the latter into said second powder flow passage, whereby powder is drawn in through said powder inlet opening and entrained along said flow path;

means for effecting relative adjustable displacement of said first and second flow constrictors to adjust the size of said annular gap and thereby to adjust the rate of flow of the powder through said apparatus;



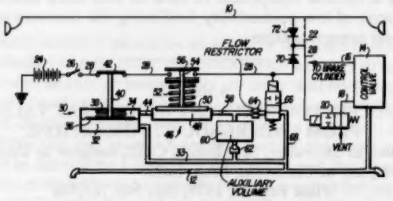
a vibrator for vibrating said apparatus to improve the powder flow therethrough, said compressed gas supply passage communicating with said annular gap through said vibrator, whereby the compressed gas both operates the vibrator and entrains the powder; and

means defining at least one fixedly open by-pass passage communicating with said compressed gas supply passage and said powder outlet and by-passing said annular gap and said second powder flow constrictor.

4,105,257
ELECTRO-PNEUMATIC APPARATUS FOR GRADUATED BRAKE RELEASE

Thomas H. Engle, Cape Vincent, N.Y., and John J. Harris, Meadville, Pa., assignors to General Signal Corporation, Rochester, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,386
Int. Cl.[2] B60T *13/70*
U.S. Cl. 303—15 10 Claims



1. Apparatus for providing graduated, pneumatically controlled brake pressure release in a rail car brake system of the type having an electrically controlled, normally open holding valve for controlling depressurization of brake cylinders of rail car brake actuators, said apparatus comprising:

a brake pipe for passing fluid pressure signals along said rail

car brake system to control application and release of said brake actuators;

a source of electrical power having an output circuit connected to close said holding valve when current flows in said output circuit;

an auxiliary volume;

first normally closed switch means connected in said output circuit to conduct current from said source, for opening said output circuit when the pressure in said brake pipe exceeds the pressure in said auxiliary volume by a predetermined amount;

flow control means responsive to current flow in said output circuit for connecting said auxiliary volume to said brake pipe when said output circuit is open; and

means for maintaining the pressure in said auxiliary volume no greater than the pressure in said brake pipe,

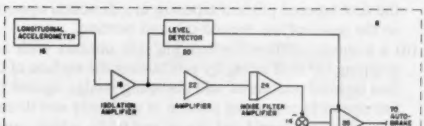
whereby said output circuit is alternately opened and closed during repressurization of said brake pipe to signal a brake release, thereby providing graduated release of pressure in said brake cylinder pipe as said holding valve opens and closes.

4,105,258

SERVO TYPE SWITCHING FOR REMOTE AUTOMATIC BRAKING SYSTEM

Jay W. Bornfleth, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 19, 1977, Ser. No. 798,413
Int. Cl.² B60T 8/12
U.S. Cl. 303—93 **1 Claim**



1. A remote automatic braking system for an aircraft vehicle with servo switching means attached to automatic brakes subject to system override if said vehicle is having thrust applied which comprises:

a command system for engaging said automatic brakes by an initial signal which serves as a triggering impulse;

a transition amplifier providing smooth engagement of said triggering from the command system, said transition amplifier positioned to receive said triggering impulse;

an error amplifier/integrator containing a summing junction input which has an output of said transition amplifier as an input;

a longitudinal accelerometer for establishing a reference signal representative of the acceleration state of said vehicle, said longitudinal accelerometer reference signal is an input to said error amplifier/integrator which is compared to said initial signal;

an isolation amplifier electrically connected between said accelerometer and said error amplifier/integrator for preventing loading of said accelerometer by feedback;

a level detector connected between said isolation amplifier and said error amplifier/integrator which is set to a predetermined level of acceleration due to thrust being applied and triggered by an output signal from said isolation amplifier which is greater than said predetermined level so that when said signal is greater than said predetermined level said level detector inputs a signal to said error amplifier/integrator to not engage said automatic brakes if said triggering impulse from said command system is received;

an amplifier connected in parallel with said level detector between said isolation amplifier and said error amplifier/integrator for boosting said isolation amplifier output signal to a predetermined level suitable for inputting to said summing juntion in said error amplifier/integrator; and

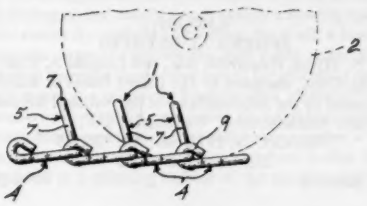
a noise filter for eliminating extraneous signals from said accelerometer prior to entry of said accelerometer amplified output signal into said summing junction of said error amplifier/integrator whose function is determined by said level detector so that for a given condition in said level detector said error amplifier/integrator amplifies or integrates.

4,105,259

ENDLESS TRACK FOR A TRACKED VEHICLE

Rosaire Boucher, 78 St. Olaf Street, Sept-Iles, Canada (G4R 1R9)

Filed Apr. 26, 1977, Ser. No. 791,038
Int. Cl.² B62D 55/20
U.S. Cl. 305—50 **1 Claim**



1. An endless track for a tracked vehicle toy comprising a plurality of interconnected links, each consisting of a length of wire bent into a generally U-shaped configuration when seen in top plan view, defining opposite end portions and an intermediate portion, the latter extending transversely of the endless track and being bent into a sinusoidal configuration lying in a commmon plane nearly perpendicular to the plane containing said end portions, said sinusodial configuration defining a wheel tread engaging concave central portion and a pair of similar wheel guides extending on each side of a vehicle wheel and formed by slightly diverging first legs, each leg being extended by a convex portion in turn extended by a second leg outwardly spaced from the respective first legs and in turn extended by a short pivot portion, such short pivot portions being aligned transversely of the track and located at substantially the level of said concave central portion, said opposite end portions forming extensions of said short pivot portions and extending longitudinally of the track and forming a hook at the outer end thereof, the hooks of each link pivotally engaging the respective short pivot portions of a next link, the distance between said concave portion and each of said convex portions being equal to at least 0.6 times the distance between said end portions.

4,105,260

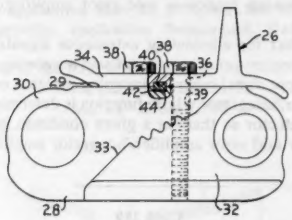
TRACK SHOE AND BOLT RETENTION ARRANGEMENT

Dennis L. Blunier, Danvers, and Donald E. Clemens, Tremont, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 601,869, Aug. 4, 1975, abandoned. This application Dec. 22, 1976, Ser. No. 753,602
Int. Cl.² B62D 55/28
U.S. Cl. 305—54 **12 Claims**

1. In a master link having an outer surface for receiving a track shoe, said link being split into two separable parts along a generally diagonal plane relative to the length of said link, said outer surface of said link having a slot formed therein, said

track shoe having a slot in the bottom surface thereof aligned with said slot in said link, said slot in said link and said slot in said track shoe being rectangular in cross section, rectangularly-shaped key means seated in said aligned slots for bridging the parting line between said link and said track shoe, a pair of



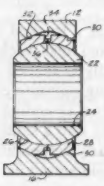
aligned openings in said track shoe and said link for receiving a pair of bolts for securing said track shoe to said link whereby tightening said bolts seats said key means in said aligned slots so that shear stress between the shoe and the link is taken by the key means.

4,105,261

SPHERICAL BEARING

William N. Myers, Huntsville, Ala., and Leopold A. Hein, Fayetteville, Tenn., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 29, 1976, Ser. No. 736,909
Int. Cl.[2] F16C *23/08*
U.S. Cl. 308—72 **6 Claims**



1. A spherical bearing comprising:
(a) an inner ball having an opening for receiving a shaft and a spherical outer surface;
(b) a circular outer race having an inner surface that is complementary in shape with said spherical outer surface of said inner ball;
(c) said circular outer race including a plurality of circumferentially spaced sections which extend around said inner ball snugly receiving said inner ball; and
(d) a groove extending circumferentially around said race defining a thin wall portion, said thin wall portion being substantially less than 1/2 the thickness of said race, which permits flexing about said thin wall portion of the outer portions of the race relative to said ball for maximizing the physical contact between the inner surface of the race and the spherical outer surface of said ball.

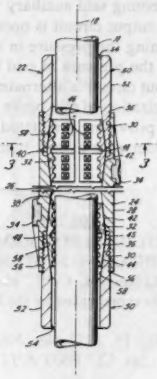
4,105,262

RELEASABLE DRILL STRING STABILIZER

Vernon T. Richey, 3061 Los Palmas, Houston, Tex. 77027

Filed Apr. 22, 1977, Ser. No. 789,969
Int. Cl.[2] F16C *1/26*; E21B *17/10*
U.S. Cl. 308—4 A **6 Claims**

1. A releasable stabilizer for adjustable positioning along a drill string, comprising:
(a) a body for positioning around the drill string having
(i) female threads at each end of the body on the interior surface,
(ii) a tapered portion of the interior surface extending outwardly to the female threads,
(iii) blades extending from the exterior surface of the body to contact the bore hole;
(b) an end cap for each end of said body having
(i) male threads at one end on the exterior surface,
(ii) a tapered portion of the interior surface extending outwardly toward the end with the male threads; and
(c) at least one clamping wedge for each end of said body having



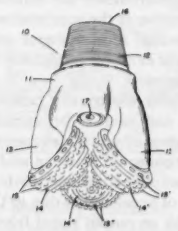
(i) a surface formed by first and second tapered portions, the first tapered portion tapering in a direction opposite to the taper of the second tapered portion,
(ii) a gripping surface for moving into contact with and gripping the drill string by positioning the surface of the first tapered portion of said clamping wedge against the interior surface tapered portion of said body and threadably connecting said end cap to said body, which causes the interior surface tapered portion of said end cap to move against the surface of the second tapered portion of said clamping wedge for ultimately attaching the stabilizer onto the drill string.

4,105,263

JOURNAL AND PILOT BEARINGS WITH ALTERNATING SURFACE AREAS OF WEAR RESISTANT AND ANTI-GALLING MATERIALS

Robert Keith Sorensen, Dallas, and Anthony T. Rallis, Spring, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex., by said Robert Keith Sorensen

Division of Ser. No. 395,880, Sep. 10, 1973, Pat. No. 3,984,158.
This application Jul. 19, 1976, Ser. No. 706,338
Int. Cl.[2] F16C *33/24*
U.S. Cl. 308—8.2 **5 Claims**



1. A bearing element, comprising:
a bearing shaft,

a rotatable member mounted on said bearing shaft,

a bearing element between said bearing shaft and said rotatable member, said bearing element having an uninterrupted matrix of pressed porous sintered ferrous alloy powder, said matrix having a surface, and

an anti-galling metal infiltrated into said pressed porous sintered ferrous alloy powder matrix substantially deeper than said surface and extending substantially throughout the entire matrix.

4,105,264

PROCESSING ROLLER HAVING REINFORCING JACKET OF HARD METAL

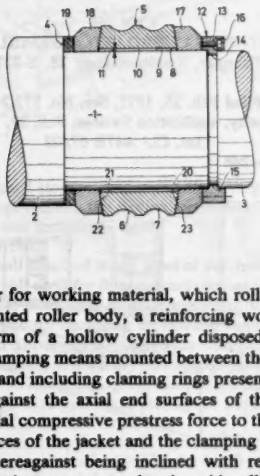
Heinz Zimmermann, and Wolfgang Martens, both of Krefeld, Fed. Rep. of Germany, assignors to Günther Hertel, Nüremberg and Karl Gustav Hertel, Fürth, both of Fed. Rep. of Germany

Filed Apr. 27, 1977, Ser. No. 791,299

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618884

Int. Cl.² F16C *13/00*

U.S. Cl. 308—20 **9 Claims**



1. In a roller for working material, which roller includes a rotatably mounted roller body, a reinforcing working jacket having the form of a hollow cylinder disposed around the roller body, clamping means mounted between the roller body and the jacket and including claming rings presenting surfaces which bear against the axial end surfaces of the jacket for applying an axial compressive prestress force to the jacket, the axial end surfaces of the jacket and the clamping ring surfaces which bear thereagainst being inclined with respect to the roller axis, the improvement wherein said roller body and working jacket define an annular gap between the inner peripheral surface of said working jacket and the outer peripheral surface of said roller body, the dimension of said annular gap in the direction between said jacket and roller body being sufficiently large to maintain the outer peripheral surface of said roller body and the inner peripheral surface of said working jacket out of contact with one another during operation of said roller at temperatures extending over its entire operating temperature range, and said roller comprises means defining a radially-extending abutment surface fixed relative to said roller body and axially spaced from one of said clamping rings, and resiliently deformable force transmitting means compressively held between said abutment surface and said one of said clamping rings.

4,105,265

VIBRATION DAMPING BEARING ARRANGEMENT

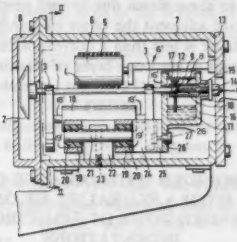
Fritz Stahlecker, Uberkingen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of Germany

Filed Apr. 12, 1976, Ser. No. 676,160

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1975, 2515783

Int. Cl.² F16C *13/00*

U.S. Cl. 308—158 **37 Claims**



1. A bearing arrangement for a shaft in an open-end spinning unit having an end axially urged against a bearing means, guide roller means for radially supporting the shaft, a bearing block means for rotatably supporting said guide roller means, and vibration damping supporting means for mounting said bearing block means at a relatively fixed element, characterized in that means are provided for connecting the bearing means with said bearing block means such that said bearing means is supported by said bearing block means, characterized in that the shaft is connected to a spinning turbine of the spinning unit.

4,105,266

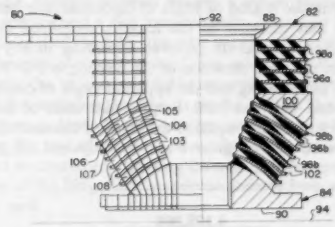
LAMINATED BEARING WITH PLURAL MODULUS LAYER

Robert H. Finney, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Continuation-in-part of Ser. No. 632,423, Nov. 17, 1975, Pat. No. 4,040,690. This application Aug. 1, 1977, Ser. No. 821,003

Int. Cl.² F16C *27/06*

U.S. Cl. 308—237 R **7 Claims**



1. In a laminated bearing comprising a plurality of alternating and bonded together layers of elastomeric material and substantially nonextensible material, said layers alternating along a common axis extending lengthwise of the bearing so as to permit the bearing to support compressive loads applied generally normal to the layers and to accommodate torsional loads applied about the common axis, each layer being annular and having with respect to the common axis a radially inner circumference and a radially outer circumference, the layers including at least one layer of elastomeric material which if formed to have a nominally constant modulus of elasticity throughout and if subjected to a predetermined compressive load applied generally normal to the layer would experience a

greater shear strain adjacent one of its inner and outer circumferences than adjacent the other of its inner and outer circumferences,

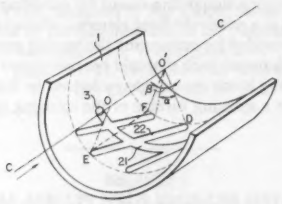
the improvement wherein said at least one layer of elastomeric material is formed to have a higher nominal modulus of elasticity adjacent the one of its circumferences than adjacent the other of its circumferences, the difference between said nominal moduli of elasticity being such that a ratio of shear strain due to said predetermined compressive load adjacent the one circumference of said at least one layer to shear strain due to said predetermined compressive load adjacent the other circumference of said at least one layer is less than a corresponding ratio of shear strains in said at least one layer of elastomer if formed to have said nominally constant modulus of elasticity throughout.

4,105,267

BEARING PROVIDED WITH OBLIQUE OIL GROOVES AND/OR WITH A PLURALITY OF OBLIQUELY ARRANGED ROWS OF SEMICIRCULAR INDENTATIONS

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company, Ltd., Nagoya, Japan

Filed Mar. 8, 1977, Ser. No. 775,497
Claims priority, application Japan, Mar. 19, 1976, 51-30216
Int. Cl.[2] F16C *33/66*
U.S. Cl. 308—240 **5 Claims**



1. A semicircular cylindrical bearing having axially spaced edges and circumferentially spaced edges, said bearing comprising oil grooves disposed in a direction oblique with respect to the axial direction of said bearing on the internal surface thereof, said oil grooves terminating at a substantial distance away from the circumferentially spaced edges and from the axially spaced edges of the bearing and being disposed only substantially in the region of angle of circumference between 60°–150° so that the sum of the lengths, measured on said internal surface, of said oil grooves appearing in any cross section cut in the axial direction of the bearing is 5%–50% of the width of said bearing and the apparent angle of circumference β formed between both longitudinal ends of said oil groove is greater than or equal to the angle of circumference α formed between said oil groove and the adjacent oil groove substantially parallel to that oil groove.

4,105,268

DOCUMENT HANGING SYSTEM

Abram G. Elias, 3300 Skyline Blvd., No. 205, Reno, Nev. 89510, and Peter G. Elias, 6 Wedgewood Dr., Winnipeg, Manitoba, Canada (R3T2J8)

Continuation-in-part of Ser. No. 620,569, Oct. 8, 1975, Pat. No. 4,009,784, which is a continuation-in-part of Ser. No. 514,890, Oct. 15, 1974, Pat. No. 3,923,353, which is a continuation-in-part of Ser. No. 374,007, Jun. 27, 1973, abandoned. This application Feb. 14, 1977, Ser. No. 768,360
Int. Cl.[2] A47B *63/00*; B42F *15/00*
U.S. Cl. 312—184 **29 Claims**

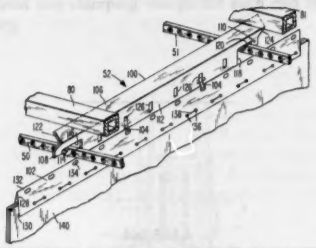
1. A document hanging system for use in hanging documents upon a pair of spaced horizontal rails, the system comprising

a rigid strip-like supporting bar having an upper load carrying portion with ends adapted to overhang and be supported by the rails,

the width of said support bar extending vertically,

said supporting bar having a lower document supporting portion with a plurality of spaced openings and extending downward between the rails,

document attachment means having a plurality of spaced openings with the same spacing as the supporting bar openings,



a plurality of flexible straps each having head portions at the opposite ends thereof and passing through the corresponding openings in both the supporting bar and document attachment means,

said head portions of each strap interlocking with at least one of the corresponding openings in the supporting bar and document attachment means, and

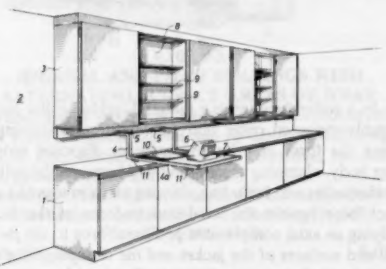
means for fastening a document to the document attachment means.

4,105,269

KITCHEN CUPBOARD ASSEMBLIES

Tore Georg Palmaer, Smultronvägen 28, S-331 00 Värnamo, Sweden

Filed Feb. 25, 1977, Ser. No. 772,249
Claims priority, application Sweden, Feb. 27, 1976, 7602887
Int. Cl.[2] A47B *67/02*
U.S. Cl. 312—248 **4 Claims**



1. A kitchen cupboard assembly comprising, in combination:

a. a lower floor mounted cupboard unit, having an upper working surface and at least one cupboard therein;

b. an upper wall mounted cupboard unit having at least one cupboard therein, said upper wall mounted cupboard unit being spaced from the lower floor mounted cupboard unit having a vertical frontal face;

c. said latter at least one cupboard having a generally planar door, a support frame for said door extending about the periphery of said one cupboard, and hinge means for swinging said door relative to said frame about a vertical axis to open and close said at least one cupboard;

d. said frame having a bracket extension below said door and hinge means connecting the bracket extension to the

lower edge of the face of said at least one cupboard, said support frame comprises a hinge means, a first portion extending away from said hinge means, a second portion perpendicular to said first portion and having a length substantially equal to the depth of said at least one cupboard, a third portion extending from said second portion parallel to said first portion, wherein said support surface is at the end of said third portion remote from said second portion for pivoting about a horizontal axis between a lower position and an upper position;

e. wherein the inside face of said door forms (i) a support surface extending horizontally in said lower position while resting against said upper working surface and (ii) a vertical cupboard door in said upper position;

f. said bracket extension being recessed within said at least one cupboard in said upper position and shaped so that in the lower position the associated frame and door rest in a horizontal plane upon the support surface of said lower floor mounted cupboard and extend cantilevered outwardly therefrom.

4,105,270

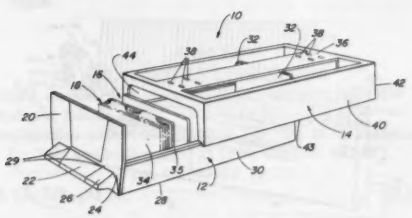
RECIPE CARD STORAGE DEVICE AND DISPLAY MEANS

Helen G. Bergkamp, and Robert L. Bergkamp, both of Rte. 2, Cheney, Kans. 67025

Continuation-in-part of Ser. No. 648,935, Jan. 4, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 782,064

Int. Cl.[2] A47B *63/00*

U.S. Cl. 312—330 R **3 Claims**



1. A recipe card storage device for displaying recipe cards and storing them therein, the device comprising:

a sliding drawer including:

a drawer front;

a drawer pull attached to the front of the drawer front, the drawer pull used for opening and closing said drawer, a horizontal elongated groove formed in the top of the drawer pull for recieving the bottom edge of the recipe card and displaying the recipe card therein, the drawer pull including outwardly extending protuberances in the groove for engaging the sides of the bottom edge of the recipe card and compressing the card between the pull and the drawer front;

an open drawer top for receiving recipe cards therein;

a drawer bottom attached to the drawer front and having a plurality of parallel slots disposed in a spaced relationship along the length of the drawer bottom;

drawer sides attached to the drawer bottom and the drawer top, the top of the drawer sides including outwardly extending horizontal drawer slides;

a drawer back attached to the drawer sides and the drawer bottom;

an inverted "U" shaped drawer housing including:

a horizontal housing top for attaching to the bottom of a cabinet or the like, the top including a downwardly extending stop, the stop engaging the back of said drawer when said drawer is pulled outwardly from said drawer housing;

vertical housing sides attached to the housing top, the bottom of the housing sides having inwardly extending horizontal drawer guides for receiving the horizontal drawer slides thereon and guiding said drawer in said housing;

a vertical housing back attached to the housing top and sides;

an open housing bottom;

an open housing front for receiving the drawer front of said drawer adjacent thereto; and

a "U" shaped card holder having vertical sides attached to a bottom, the bottom of said card holder having downwardly extending protuberances, said protuberances received in the parallel slots in the bottom of said drawer in a snap-fit for holding said card holder in said drawer.

4,105,271

DESKS

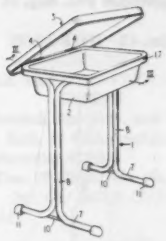
Harry Sebel, Bankstown, and Noel Sydney Davidson Wood, Hunters Hill, both of Australia, assignors to Sebel Limited, Australia

Filed Jun. 29, 1977, Ser. No. 811,389

Claims priority, application Australia, Jun. 30, 1976, 6480/76

Int. Cl.[2] A47B *3/00*

U.S. Cl. 312—253 **8 Claims**



1. A desk, comprising; a frame of cylindrical metal tubing, including a portion which extends around a horizontal area to provide a substantially rectangular rack; a lid having a snap-on, snap-off hinge for hingedly connecting the lid to one side of the rack; and a box having a base and four walls, at least two of the walls each having an outwardly extending flange, and the box being removably insertable within the rack and being supported by engagement of the outwardly extending flanges with sides of the rack, the hinge comprising, a tube of resilient synthetic plastics material having a substantially cylindrical inner surface and a slot longitudinally extending from one to another end of the tube, the tube being resiliently deformable to permit the slot to be passed over said one of the rack sides, whereby the tube is releasably secured to said one side, and means for securing the tube to the lid, so that the lid is pivotable from a lowered box closing position in which the lid covers the top of the box, to a raised box opening position, subject to continued rotation of the lid causing resilient deformation of the hinge tube an release thereof from said one side of the rack.

4,105,272

HIGH CURRENT GROUNDING ASSEMBLY HAVING RIGID INTERCONNECTING CONDUCTORS

Edward L. West, and Melvin E. Clutter, both of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Jul. 11, 1977, Ser. No. 814,285

Int. Cl.[2] H01R *3/06*

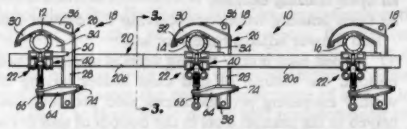
U.S. Cl. 339—14 L **7 Claims**

1. A grounding assembly for electrically connecting conductors and grounding the same, comprising:

a metallic, releasable, conductor-gripping clamp for each of said conductors;

means electrically interconnecting said clamps and thereby

said conductors, including at least one elongated, rigid, metallic connector element, and means for mechanically securing and electrically connecting said element with said clamps; and



means for grounding said electrically interconnected conductors.

4,105,273

PLUG ASSEMBLY

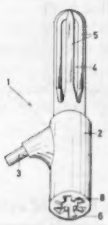
Siegfried Henschke, Erftstadt, and Albert Lindberg, Cologne Marienburg, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,662

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637513

Int. Cl.² H01R *25/00*

U.S. Cl. 339—47 R **23 Claims**



1. In an electric plug assembly formed of a plug having a handle part and a contact part projecting from the handle part and a socket adapted to receive, by insertion, the contact part of the plug; the socket having electric contacts arranged to engage the contact part of the plug in the inserted state, the improvement comprising a plurality of longitudinal, electrically insulating spaced ribs forming part of said plug and constituting a cage surrounding said contact part; and a plurality of electrically insulating, spaced protrusions arranged in a circular array and forming part of said socket; said protrusions being in an interleaving relationship with said ribs in the inserted state of said plug.

4,105,274

CHILD SAFETY DEVICE FOR RETAINING ELECTRICAL PLUGS

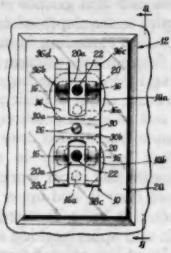
Richard W. Casey, 20 E. Cedar St., Apt. 15-C, Chicago, Ill. 60611

Filed Apr. 1, 1977, Ser. No. 783,827

Int. Cl.² H01R *13/54*

U.S. Cl. 339—75 P **11 Claims**

1. A safety device for use in retaining an electrical plug or the like within an electrical outlet socket, said device comprising a unitary member having a base portion adapted to be secured to an electrical outlet, and a pair of bifurcated arm portions extending away from said base portion in opposite directions therefrom, said bifurcated arm portions each having a generally arcuate side profile and defining a pair of spaced arms adapted to extend over and engage the outwardly extending portion of an electrical plug when plugged into the electrical outlet socket to which the device is secured with the cord of the plug extending between said spaced arms, said spaced



arms being of sufficient rigidity to prevent unintentional withdrawal of the plug from the socket.

4,105,275

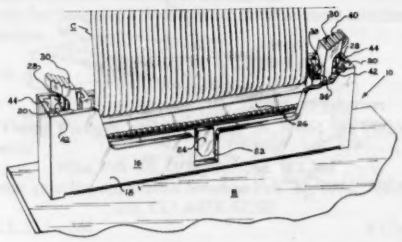
HEADER WITH INTEGRAL LATCH MEMBERS

Daniel Allen Dixon, West Chester, Pa., and George Thomas Eigenbrode, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 18, 1977, Ser. No. 825,646

Int. Cl.² H01R *13/54*; H05R *1/10*

U.S. Cl. 339—91 R **4 Claims**



1. A vertical header adapted to receive a connector having a plurality of electrical terminals mounted therein, said header comprising: an elongated block having a plurality of straight pins mounted therein and a generally rectangular, unitary housing surrounding said block, said header having a lower face for mounting against a surface of a circuit board, said housing having a cavity at each end of said block extending from said lower face to the top of the housing; and a latch member extending from each end of the block integrally molded with the block, each latch member including a pair of elongated arms extending from said block and a latch joining the arms at their outer ends, said latch having a latch surface extending from a side thereof toward the other latch.

4,105,276

LAMPHOLDER-SOCKET FOR CIRCLINE FLUORESCENT LAMP

Jack V. Miller, Sierra Madre, Calif., assignor to Killerwatt Corp., Los Angeles, Calif.

Filed Feb. 22, 1977, Ser. No. 770,752

Int. Cl.² H01R *9/08, 33/02*

U.S. Cl. 339—95 D **21 Claims**

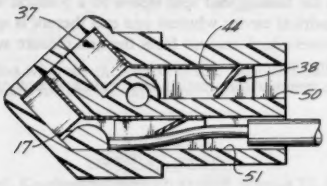
1. An electrical socket comprising:

an electrically insulative body doglegged at approximately between 130° and 140°;

a plurality of passages extending through the body from end to end, each passage having first and second sections that

join at an obtuse angle between approximately 130° and 140°;

a conductive terminal disposed in each passage, the terminal having in a one piece construction a first channel-shaped portion adapted to receive a plug pin, a second portion having a flap extending across the passage inclined toward the first portion, and a third portion connecting the first and second portions, and the third portion of each terminal being bent to permit the first portion to lie in the first



section of each passage and the second portion to lie in the second section of each passage, the flap being longer than the height of the passage so as to prevent inclination of the flap away from the first portion and so as to wedge a wire inserted in the second portion between the flap and the side of the passage, thereby electrically connecting and mechanically securing the inserted wire; and

means for retaining the terminals in their respective passages.

4,105,277

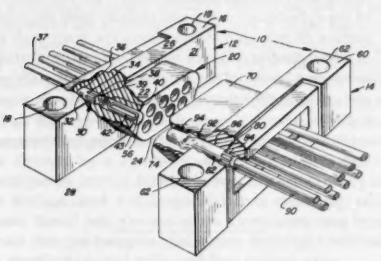
ELECTRICAL CONNECTOR

Leonard Jacobs, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 537,078, Dec. 30, 1974, abandoned. This application Jun. 2, 1976, Ser. No. 692,082

Int. Cl.² H01R *13/20*

U.S. Cl. 339—95 R **9 Claims**



1. A plug-in electrical connector assembly, including:

first and second base members which are maintained in predetermined mutual orientation when the components of the assembly are mated;

an electrical contact element having a portion thereof rigidly fixed to said first base member and including a free end portion extending from said first base member, said free end portion being resilient in torsion and terminating in a longitudinally elongated segment having an elongated transverse cross section; and

an electrical conductor element, rigidly fixed at a first end thereof to said second base member, comprising a hollow tube including an inner surface and an opening, at the distal end of said conductor element, for receiving said elongated segment and having a transversely elongated, narrow constriction, constituted by a continuous portion of said inner surface, having a shape substantially complementary to said cross section of said segment but oriented with its major axis at a substantial angle relative to the cross section of said segment when said base members are in such predetermined mutual orientation, said constriction being substantially displaced within said hollow tube from the respective ends thereof, and means for guiding said segment into said constriction by elastic twisting of said contact element as one of said base members is moved toward the other in said predetermined mutual orientation;

wherein said longitudinally elongated segment is of sufficient length to extend through and substantially beyond said constriction when said assembly components are mated, whereby said electrical conductor element makes contact with said segment at a point substantially displaced from the end thereof.

4,105,278

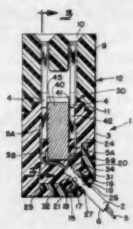
MOLDED CABLE TERMINATION ASSEMBLY WITH INSERT

Kenneth William Braund, Newbury, and John Lawrence Webster, Painesville, both of Ohio, assignors to A P Products Incorporated, Painesville, Ohio

Filed Dec. 20, 1976, Ser. No. 752,469

Int. Cl.² H01R *13/58*

U.S. Cl. 339—103 M **22 Claims**



1. A molded cable termination assembly, comprising

an electrical cable including a plurality of electrical conductor means for conducting electric energy and woven electrical insulation,

electrical terminating means for terminating said electrical conductor means,

housing base means molded under pressure conditions directly and integrally to and about at least part of said cable, including at least part of said conductor means and woven electrical insulation, and said electrical terminating means for firmly holding the same in relatively fixed relation, and

seal means positioned directly between at least part of said woven insulating means and part of said housing base means for impeding wicking of fluid-like material along said woven electrical insulation externally of said housing base means during molding thereof thereby to maintain the relative flexibility of said cable externally adjacent said housing base means, said seal means including means for bearing against said woven electrical insulation with a force that increases in response to such pressure during molding of said housing base means to develop a pressure seal to impede any such wicking.

4,105,279

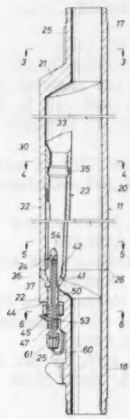
REMOVABLE DOWNHOLE MEASURING INSTRUMENTS WITH ELECTRICAL CONNECTION TO SURFACE

Bernard J. P. Glotin, Saint Maur, and Andre J. Guimard, Le Mee sur Seine, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 751,419, Dec. 16, 1976, abandoned, which is a continuation of Ser. No. 615,145, Sep. 19, 1975, abandoned, which is a division of Ser. No. 447,443, Mar. 1, 1974, Pat. No. 3,939,705. This application Dec. 2, 1977, Ser. No. 856,717

Int. Cl.[2] H01R *3/04*

U.S. Cl. 339—117 R **7 Claims**



1. Apparatus adapted for the installation of an instrument in a well, comprising: an elongated hollow mandrel; means at each end of said mandrel arranged for connection to a production string, said mandrel having a vertical main bore extending therethrough; means in said mandrel located to the side of said main bore forming an elongated pocket having a longitudinal axis offset from said main bore and adapted to receive an instrument, the upper end of said pocket opening to the interior of said mandrel and communicating with said bore intermediate the ends of said mandrel; an opening through the wall of said mandrel into the lower end of said pocket, said opening extending to the exterior of said mandrel and being axially aligned with said longitudinal axis; and an electrical contact assembly extending through said opening and being sealably fixed to said mandrel, said contact assembly providing contact means projecting into said pocket at the lower end thereof for providing an insulated electrical connection between an instrument implanted in said pocket and an electrical cable located externally of said mandrel.

4,105,280

HIGH CURRENT DENSITY ELECTRICAL CONTACT

Lloyd E. Thompson, Jr., 158 Clark Rd., Rye, N.H. 03870

Continuation of Ser. No. 680,624, Apr. 26, 1976, abandoned. This application Mar. 30, 1977, Ser. No. 782,820

Int. Cl.[2] H01R *7/06*

U.S. Cl. 339—273 S **9 Claims**

1. An electrical connector having a high current carrying capacity, comprising in combination

a receptacle having an open-ended cylindrical cavity formed therein;

a split sleeve slidably accommodated within said cylindrical cavity,

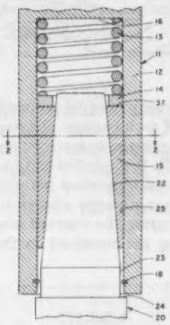
said split sleeve consisting of two separate halves which have slightly less than semi-circular circumferences whereby said split sleeve normally fits loosely within said cylindrical cavity,

said split sleeve having a wall thickness which decreases linearly from one end thereof to the other so as to provide said split sleeve with a tapered internal passageway therethrough and having a length which is less than the depth of said cylindrical cavity,

the outer wall surface of said split sleeve and the inner wall surface of said cylindrical cavity having the same curvature;

means for biasing said split sleeve to a position within said cylindrical cavity whereat one end thereof is spaced by a predetermined amount from the end closure wall of said cavity; and

a male member terminating in a truncated conical pin portion that has a taper which matches that of said internal passageway,



a length of said pin portion being disposed within said split sleeve,

said pin portion being dimensioned such that whenever said male member is inserted into said receptacle and moved to its operating position, both halves of said split sleeve are displaced axially toward the end closure wall of the cylindrical cavity and radially until the outer wall surface of said split sleeve meets the inner wall surface of said cylindrical cavity whereby contact is established between a length of the pin portion of said male member and the complete internal surface of said split sleeve and between a length portion of the inner wall surface of said cylindrical cavity and the complete external surface of said split sleeve.

4,105,281

SCANNING MINOR STABILIZER

Morris Burton Johnson, Braintree, and Charles Raymond William Richardson, Chelmsford, both of England, assignors to The Marconi Company Limited, England

Filed Apr. 26, 1977, Ser. No. 790,956

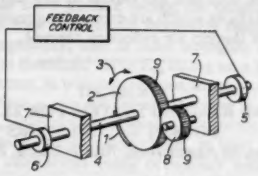
Claims priority, application United Kingdom, May 7, 1976, 18745/76

Int. Cl.[2] G02B *27/17*

U.S. Cl. 350—6.5 **6 Claims**

1. A mirror arrangement including a mirror arranged to view a volume of space, said mirror being carried by a support, a balance member for said mirror, and means mounting said mirror, said support and said balance member for rotation, said balance member being a rotatable mass having gear teeth meshed with gear teeth provided on said support for said

mirror such that rotation of said support and mirror in one direction causes rotation of said balance member in the opposite direction whereby the inertia of said balance member tends to compensate for the inertia of said mirror.



4,105,282

OPTICAL SIGHT

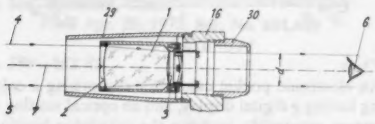
Rudi Schael, Kandinskystrasse 27, D-8000 Munich 71, Fed. Rep. of Germany

Filed Jul. 22, 1976, Ser. No. 707,493

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1975, 2532930

Int. Cl.² G02B 27/32

U.S. Cl. 350—10 19 Claims



1. In an optical sight wherein a target is sighted through a telescope-like optical device provided with an objective portion and an ocular portion, and wherein a target mark disposed within said optical device is projected into the infinite such as to be seen in a single plane with said target, said telescope-like optical device having a convex optically effective objective first surface for converging parallel light rays emitted from the target, a concave optically effective second surface for parallel re-alignment of the converged light rays, a target mark on said second surface, and a semi-transparent mirror surface disposed in said optical device whereby said target mark is projected onto said semi-transparent mirror surface and reflected thereby, the improvement comprising said telescope-like optical device formed as a single homogeneous lens body made of light-transmitting material having said optically effective first surface formed by a frontal surface of said lens body, said semi-transparent mirror surface being disposed directly on said frontal surface, and a cylindrical barrel enclosing said lens body, said barrel being mounted on a mounting ring by means of at least one quadrangular flat spring defining a substantially square aperture coaxial with said lens optical axis.

4,105,283

COMPENSATION FOR MATERIAL DISPERSION IN OPTICAL FIBERS

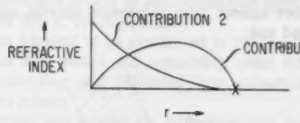
Detlef Christoph Gloge, Red Bank; Ivan Paul Kaminow, Tinton Falls, and Herman Melvin Presby, Highland Park, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 1, 1977, Ser. No. 764,549

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.31 5 Claims

1. An optical fiber for guiding a spectrum of electromagnetic radiation of finite bandwidth comprising a core region surrounded by a cladding region wherein said core region has a radial refractive index profile which decreases toward said cladding characterized in that said radial refractive index profile is a composite profile which substantially lessens modal dispersion near a high intensity wavelength of said spectrum within said finite bandwidth which includes both shorter and longer wavelength electromagnetic radiation of lesser intensity, said composite profile being composed of at least two contributory profiles each associated with a different index-varying contribution wherein at least two of said contributory profiles are different from said composite profile whereby the total dispersion for the said finite bandwidth is reduced relative to that resulting from a reference fiber in which the effective profile is the same as the said composite profile but in which said contributory profiles associated with said index-varying contributions are approximately the same.



4,105,284

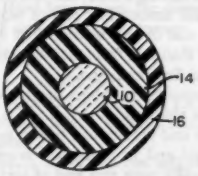
BUFFERED OPTICAL WAVEGUIDE FIBER

Robert Olshansky, Addison, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 10, 1976, Ser. No. 684,650

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.33 4 Claims



1. A buffered optical waveguide fiber comprising

an optical waveguide fiber formed of a material having a Young's modulus E_f and having a radius R_f,

a first layer of a first plastic material having a Young's modulus E_i disposed on the external surface of said fiber, E_f being at least 10 times greater than E_i, and

a second layer of a second plastic material having a Young's modulus E_o disposed on the surface of said first layer, E_i being at least 10 times greater than E_o, the ratio of the outer radius R_i of the first layer to the outer radius R_o of the second layer being substantially the value determined by the equation

$$R_i/R_o \approx 0.817 - K/18 - 27/32(E_f R_f^4/E_i R_o^4)$$

where K is given by the equation $K = (1-2\nu)$ and ν is the average Poisson's ratio for the first and second plastic materials, R_o is greater than 4 mils, the thickness of the second layer is at least 1 mil, and the ratio $(E_f R_f^4/E_i R_i^4)$ is less than 0.1.

4,105,285

SINGLE OPTICAL FIBER CONNECTOR

Michael Albert Bedgood, Harlow, and John Stuart Leach, Stortford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,597

Claims priority, application United Kingdom, Mar. 16, 1976, 10461/76

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.21 1 Claim

1. A single optical fiber connector comprising:

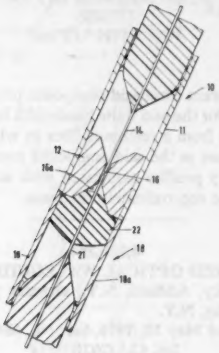
a first connector member;

a first single optical fiber secured in said first connector member and having an unsheathed end,

a watch X-jewel fixedly mounted in said connector member having a pair of oppositely opening coaxial conical recesses therein joined by a small bore, said unsheathed fiber end extending partially into said bore;

a second connector member;

a second single optical fiber secured in said second connector member against axial movement therein and having unsheathed end;



said second connector member embodying an elastomeric nose portion having a front end and a bore therein slidably receiving said unsheathed end of said second fiber, said unsheathed end of said second fiber extending forwardly in said bore than said front end whereby said nose portion protects said fiber end; and

when said connecter members are mated, said elastomeric nose portion abuts said X-jewel and is deformed axially so as to expose said unsheathed end of said second fiber thus allowing said end to enter said bore of said jewel and couple optically with said end of said first fiber.

4,105,286

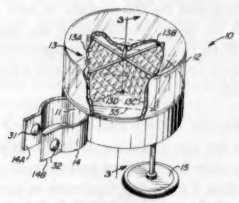
BICYCLE REFLECTOR ASSEMBLY

Mike H. Curran, 1738 E. Montecito, Phoenix, Ariz. 85016

Filed Jan. 27, 1977, Ser. No. 762,888

Int. Cl.² G02B *5/12*

U.S. Cl. 350—99 **4 Claims**



1. A reflector assembly for a vehicle comprising in combination:

a tubular housing having a transparent portion which is arranged to contain within said portion a rotatively mounted reflector,

means for securing said housing to a vehicle,

a reflector rotatively mounted on a shaft arranged in at least one bearing within said housing,

said shaft being substantially vertically positioned when mounted on the vehicle, and

means connected to said shaft for causing it and the associated reflector's rotation upon actuation thereof,

said means causing said shaft and associated reflector's rotation comprising a wheel means engageable with a wheel of the vehicle and rotative thereby,

said reflector comprises an open-ended structure pivotally rotatable with said shaft about its axis and comprising side plane surfaces which are exposed sequentially to light rays directed thereto for reflection thereof.

4,105,287

OPTICAL READING SYSTEM FOR ELECTRONIC POCKET CALCULATORS

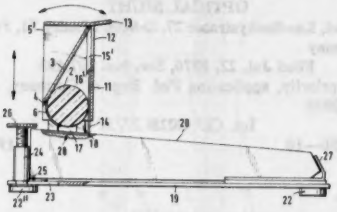
Lothar Gross, 10 Akazienweg, 7012 Fellbach, Fed. Rep. of Germany

Filed Jul. 26, 1976, Ser. No. 708,334

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1975, 2533941; Feb. 27, 1976, 2607972; Apr. 15, 1976, 2616896

Int. Cl.² G02B *17/06*

U.S. Cl. 350—113 **9 Claims**



1. An electronic pocket calculator comprising a calculator housing having a digital display, and an optical reading system with means removably securing the calculator housing, in a position above the digital display, and adjustably mounted for vertical displacement, the optical reading system including first optical reversing means positioned adjacent the digital display to reverse the image of the digital display and second optical reversing means positioned adjacent the first optical reversing means to reverse the image again thereby to provide an adjustable upright image of the digital display in an approximately vertical plane thereby to provide an upright image of the digital display, wherein the first optical reversing means consists of a cylinder of optical material and the second optical reversing means consists of a mirror arranged at an inclined angle and parallel with the longitudinal axis of the cylinder.

4,105,288

LIQUID CRYSTAL DISPLAY WITH BISTABLE CHOLESTERIC LIQUID CRYSTAL LAYER

Walter Geffcken; Hans Krueger, both of Munich, and Karl-Heinz Walter, Grafing, all of Germany, assignors to Siemens Aktiengellschaft, Berlin & Munich, Germany

Filed Sep. 14, 1976, Ser. No. 723,147

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1975, 2542189

Int. Cl.² G02F *1/13*

U.S. Cl. 350—350 **7 Claims**

1. A liquid crystal display for the representation of visual

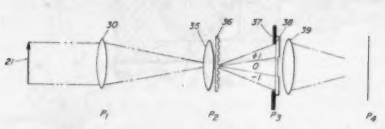
images having two carrier plates with a layer of cholesteric liquid crystal therebetween in a hermetically sealed arrangement, each of said carrier plates having an array of image conductors on its inner surface facing the other, said liquid crystal having at least in a certain frequency range a positive anisotropic susceptibility, and at field strengths equal to or greater than a first threshold value E_{cs} taking on a homeotropically-nematic texture, in which it remains as long as the applied field is greater than a second threshold value E_{nc}, E_{nc} being smaller than E_{cs}, said arrays of image conductors having at least one separately operable conductor, at least one of said arrays of image conductors being connected with boundary electrodes arranged to generate, relative to the opposite electrode in the liquid crystal layer, a field strength equal to or greater than E_{cs}, said boundary electrodes forming a narrow boundary zone completely surrounded by a visual element area, said boundary electrodes each being connected directly to the associated image conductor of said visual element area and projecting so far toward the opposite carrier plate that a minimum field strength equal to or greater than E_{cs} can prevail in said liquid crystal layer at the location of the boundary area and simultaneously a field strength less than E_{cs} and greater than E_{nc} can prevail in said visual element area.

4,105,289

APPARATUS AND METHOD FOR IMAGE SAMPLING

Ronald S. Hershel, Tucson, Ariz., assignor to University Patents, Inc., Stamford, Conn.

Filed Apr. 29, 1976, Ser. No. 681,469
Int. Cl.² G02B 5/18
U.S. Cl. 350—162 SF **46 Claims**



34. Apparatus for receiving optical radiation representative of a scene and for generating a processed image having periodic spatial amplitude modulations, comprising:

a lens located at a first imaging plane and disposed to receive said optical radiation;

a phase grating positioned adjacent said lens;

a phase retarding plate spaced from said lens and phase grating, a plurality of substantially non-overlapping ordered images of the scene being formed at said phase retarding plate; and

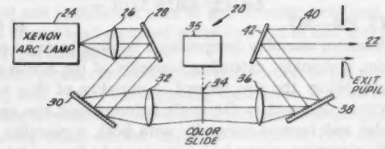
a second lens positioned adjacent said phase retarding plate and operative to image said grating at a further plane so as to produce said processed image.

4,105,290

OPTICAL COLOR COMMUNICATION SYSTEM

Bernard W. Quinn, Rancho Palos Verdes, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 10, 1976, Ser. No. 694,543
Int. Cl.² G02B 5/04, 5/18; H04B 9/00
U.S. Cl. 350—168 **10 Claims**



1. An optical color communication system comprising:

a transmitter including

a light source having a predetermined spectral output and adapted to provide collimated light therefrom,

a first diffraction means having said collimated light from said light source directed thereon and providing predetermined higher diffraction orders of said collimated light from said light source,

a first lens means for collecting said predetermined higher diffraction orders of said collimated light diffracted by said first diffraction means,

means adapted to be positioned in the focal plane of said first lens means and containing color information for modulating said diffracted light collected by said first lens means,

a second lens means for collecting and collimating the light modulated by said modulating means, and

a second diffraction means having said collimated light from said second lens means directed thereon and providing predetermined higher diffraction orders of said collimated light from said second lens means and which comprise an emergent collimated light beam from said transmitter; and

a receiver positioned to receive said emergent collimated light beam from said transmitter, said receiver including

a third diffraction means adapted to receive said emergent collimated light beam from said transmitter and provide predetermined higher diffraction orders of the collimated light of said beam,

a third lens means for collecting said predetermined higher diffraction orders of said collimated light diffracted by said third diffraction means, and

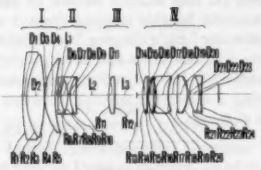
color sensitive means adapted to be positioned in the focal plane of said third lens means for detecting said color information of said modulating means.

4,105,291

LARGE APERTURE ZOOM LENS

Sadahiko Tsuji, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1976, Ser. No. 655,542
Claims priority, application Japan, Feb. 26, 1975, 50-24317
Int. Cl.² G02B 15/18
U.S. Cl. 350—184 **2 Claims**



1. A large aperture zoom lens comprising, from the direction of the object to be photographed, a first lens group for focusing and consisting of a positive compound lens having a negative meniscus lens and a biconvex lens and of a positive meniscus lens convex toward the object, a second lens group for variation and consisting of a negative lens and a negative compound lens having a biconcave lens and a positive lens, a third group for compensation consisting of a positive lens, said third group being movable to and fro for zooming, a fourth group for image forming and consisting of two positive lenses convex toward the object and a biconcave lens as well as a biconvex lens and a positive compound lens having a biconvex lens and a biconcave lens, said fourth group having the longest lens spacing between said biconcave lens and biconvex lens, said large aperture zoom lens satisfying the following conditions:

$|R_1| > |R_3|$

$|R_{14}| > |R_{16}|$

$|R_{20}| > |R_{21}|$

$2.2\ F_{IV} > |R_{23}| > 1.5\ F_{IV}$

wherein F_{IV} is the focal length of the fourth lens group,
$R_1 R_3$ the radii of the outer surfaces of the positive compound lens in the first lens group,
R_{14} and R_{16}, the radii of the surfaces facing the object in the positive lenses of the fourth lens group,
R_{20} and R_{21}, the radii of the surfaces of the biconvex lens in the fourth lens group.

4,105,292

OPTICAL ELEMENT TO ASSURE A MINIMUM SPACING

Terrence M. Conder, Stillwater, Minn., and Terence A. Jones, Columbia, Mo., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 609,428, Sep. 2, 1975, abandoned. This application Mar. 21, 1977, Ser. No. 779,892
Int. Cl.² G02B *3/08*
U.S. Cl. 350—211 **1 Claim**

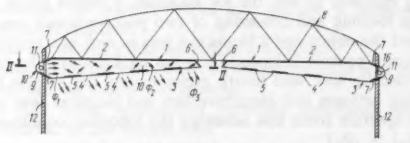
1. An improved condensing lens system for use in an overhead projector including
a light transmissive stage element having at least one smooth surface area;
at least one light-transmissive polymeric lens element having a first surface area configured as an incremental lens and a second surface area, arranged such that a smooth surface area of said stage element is juxtaposed with said second surface of said lens element,
the improvement comprising a plurality of randomly spaced projections on said second surface of said lens element having random heights ranging from 1 to 130 microns with an average height ranging from 10 to 60 microns, and having random base areas and having a population density of approximately 100 projections per square millimeter for maintaining a minimum spacing between said stage and said lens elements.

4,105,293

LIGHTING INSTALLATION BASED ON LIGHT GUIDE

Julian Borisovich Aizenberg, ulitsa Koroleva, 3ª, kv. 84, Moscow; Inokh Borukhovich Bukhman, ulitsa Volgogradskaya, 31, kv. 151, Kiev, and Vladimir Mikhailovich Pyatigorsky, ulitsa Molodogvardeiskaya, 24, korpus 5, kv. 58, Moscow, all of U.S.S.R.

Filed Aug. 25, 1976, Ser. No. 717,554
Int. Cl.² F21V *7/00*
U.S. Cl. 350—264 **11 Claims**



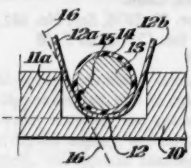
1. A lighting installation based on a light guide, which comprises:
a light guide having two surfaces;
a means for securing the light guide in a room to be lighted;
at least one light source;
at least one input device inluding an optical unit;
each of said light sources placed in said input device and directing the luminous flux of said light source into said light guide;
said first surface of said light guide reflecting said light;
said second surface of said light guide facing said lighted room and provided with alternating light transmitting and light reflective zones; and
said first and second surfaces of said light guide are positioned at an acute angle to each other, the magnitude of said angle being dependent upon the dimensions of said lighted room and the rated illumination.

4,105,294

ELECTROSTATIC DEVICE

David B. Peck, Williamstown, Mass., assignor to Dielectric Systems International, Inc., Williamstown, Mass.

Filed Aug. 4, 1976, Ser. No. 711,612
Int. Cl.² G02F *1/16*
U.S. Cl. 350—269 **5 Claims**



1. An electrostatic device for the gating of electromagnetic radiation in response to an electrical signal, comprising a rod shaped fixed electrode, a sheet of resilient conductive material, a film of insulative material being interposed between said fixed electrode and said resilient sheet, and a metal base having a groove therein, a central region of said resilient sheet being mounted between said fixed electrode and the bottom of said groove, two opposite end portions of said resilient sheet extending in opposite directions from said mounting and each of said end portions further extending outwardly from said groove and being spring loaded between an outer edge of said groove and a line of tangency at which said resilient sheet is tangent to said fixed electrode, said two extending end portions of said resilient sheet serving as two variable electrodes capable of being electrostatically drawn over said fixed electrode.

4,105,295

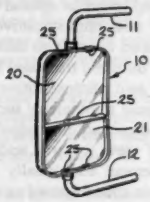
MIRROR ASSEMBLY WITH FRANGIBLE ANGULAR PROJECTIONS

Robert T. Skilliter, Jr., Genoa, Ohio, assignor to The Acme Specialty Manufacturing Company, Toledo, Ohio

Filed Jun. 22, 1977, Ser. No. 808,920
Int. Cl.² G02B *5/10*
U.S. Cl. 350—303 **10 Claims**

1. A mirror assembly comprising a housing having a peripheral rim, a shoulder extending inwardly of the housing from said rim below the top thereof, a plurality of thin angular projections disposed in the angle between said rim and said shoulder and formed integrally with both, a plurality of inwardly extending mirror lens engaging tabs formed integrally with said housing rim, and a mirror lens mounted within said housing rim and normally engaged between said angular pro-

jections and said tab, said angular projections being frangible upon contraction of said housing relative to said mirror lens by



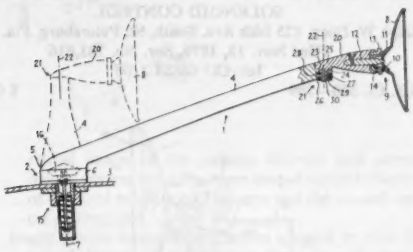
reason of exposure to a predetermined cold ambient temperature.

4,105,296

VEHICLE REAR-VIEW MIRROR WITH SUPPORT ARM HAVING INDEXING MEANS AT BOTH ENDS

Robert Derrick Tomlin, Hampton Hill, England, assignor to Magnatex Limited, Hounslow, England

Filed Nov. 22, 1976, Ser. No. 743,628
Int. Cl.² G02B *7/18*; A47G *1/24*
U.S. Cl. 350—307 **3 Claims**



1. A vehicle rear-view mirror assembly for fitting externally to a vehicle and which is selectively adjustable to extend beyond a normal rear viewing position to a position in which a driver's field of view extends beyond a side of a trailer of greater width than the vehicle which is towing the trailer, said mirror assembly comprising:

(a) a base part comprising means for securing said base part to a front fender of a vehicle;

(b) an elongate, rigid, mirror supporting arm;

(c) means mounting said supporting arm, at one end thereof, on and extending radially of said base part for turning about a substantially vertical axis relative to the base part;

(d) interengaging surface portions on said supporting arm and base part;

(e) complementary indexing means on said interengaging portions respectively and defining a plurality of indexing positions extending around said axis and of which two indexing positions are disposed approximately at right angles to each other;

(f) means resiliently urging said interengaging portions together so that the supporting arm can be located around said axis in different ones of said indexing positions;

(g) a mirror head mounted at the free end of said arm on an end portion thereof,

(h) joint means connecting said end portion to the supporting arm proper for adjusting the mirror head about another substantially vertical axis through an angle approximately equal to the angle between said two indexing positions,

(i) said joint means being provided with indexing means defining a plurality of indexing positions for locating the arm end portion in different ones of a plurality of indexing positions with respect to the arm proper, and

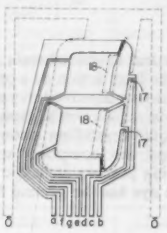
(j) means for holding the mirror head in its adjusted position relative to the arm proper.

4,105,297

FIELD EFFECT TYPE LIQUID CRYSTAL DISPLAY DEVICE

Kazuhiko Shimizu, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 22, 1977, Ser. No. 770,298
Claims priority, application Japan, Feb. 26, 1976, 51-21499
Int. Cl.² G02F *1/13*
U.S. Cl. 350—336 **2 Claims**



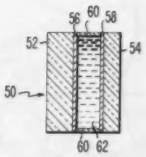
1. A field effect type liquid crystal digit displaying device including seven front electrode segments *a* to *g* and a back electrode O, a display by right edges of the front electrode segments *b* and *c* is defined by the right edges of said front electrode segments *b* and *c*, notches are formed in said rear electrode O and a display by the left edges of the front electrode segments *b* and *c* is defined by the edges of said notches in said rear electrode O.

4,105,298

ELECTRO-OPTIC DEVICES

Aaron William Levine, Lawrenceville; Grzegorz Kaganowicz, Princeton, and Pabitra Datta, Cranbury, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,401
Int. Cl.² G02F *1/13*
U.S. Cl. 350—340 **14 Claims**

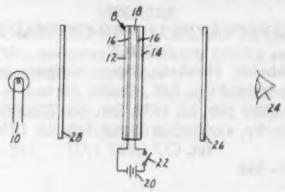


1. In an electro-optic device comprising a liquid crystal composition between two electrodes, the improvement which comprises coating each of said electrodes with a perfluorinated polymer film formed from a cyclic perfluorinated monomer by glow discharge.

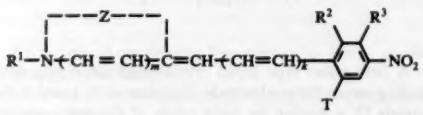
4,105,299
ELECTRO-OPTICAL DEVICES CONTAINING METHINE ARYLIDENE DYES

William A. Huffman, Minneapolis, and Harvey A. Brown, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 11, 1977, Ser. No. 786,488
Int. Cl.[2] G02F 1/13; C09K 3/34
U.S. Cl. 350—349 2 Claims



1. In an electro-optical device wherein an electrical field is imposed or withdrawn from action on a cell comprising liquid crystalline material having dissolved therein a pleochroic dye between transparent-electrode coated glass plates the improvement wherein the liquid crystalling material has net positive dieelectric anissotropy and comprises at least one nematic liquid crystallinehaving positive dielectric anisotropy and the dissolved pleochroic dye has the general formula



wherein:

Z represents the atoms necessary to complete a mono- or polycyclic dihydroheterocyclic nucleus having 5 to 6 atoms in the ring including the N of the formula where R^1 is an alkyl, substituted alkyl, alkenyl, or aryl group;

m is 0 or 1;

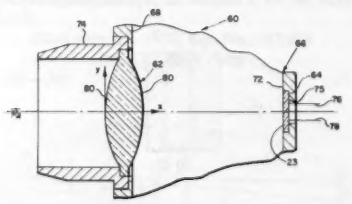
k is 0, 1 or 2;

T is selected from CF_3 or CN and R^2 and R^3 are hydrogen or together constitute a condensed carbocyclic aromatic ring.

4,105,300
DEFOCUSED UNICELL PHOTOMETER WITH ASPHERIC ZONE

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 31, 1977, Ser. No. 763,930
Int. Cl.[2] G01J 1/42; H01J 3/14
U.S. Cl. 356—225 5 Claims



1. A defocused unicell photometer for use in photographic apparatus comprising:

a photosensitive transducer having a photosensitive surface thereon of predetermined dimension, said transducer operating to provide an output response which varies in correspondence to the intensity of actinic radiation incident to said photosensitive surface;

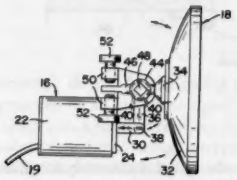
a positive lens element of predetermined focal length concentrically disposed about an optical axis which axis ultimately intersects said photosensitive surface, said lens element being spaced apart from said photosensitive surface by a distance different from said lens focal length and cooperating with said photosensitive surface to define a field of view for said photometer such that said lens element operates to direct actinic radiation incident thereon from said field of view towards said photosensitive surface, said lens element additionally having at least one non-planar aspheric zone disposed on a surface of said lens element for directing a select portion of actinic radiation, from said field of view in a manner operating to change the intensity of said select portion of actinic radiation which ultimately impinges on said photosensitive surface from said zone thereby effecting a corresponding change in that portion of said output response from said transducer which is directly attributable to said select portion of actinic radiation; and

means for stationing said transducer and lens element in substantially light-tight, spaced apart relation with respect to each other.

4,105,301
CAR MIRROR WITH U-SHAPED SLOT MEANS AND SOLENOID CONTROL

Ralph W. Doeg, 125 56th Ave. South, St. Petersburg, Fla. 33705

Filed Nov. 15, 1976, Ser. No. 741,616
Int. Cl.[2] G02B 5/08
U.S. Cl. 350—289 8 Claims



1. A vehicle mirror angling device comprising in combination:

base means connectable to the body of the vehicle;

a mirror;

pivot means pivotably mounting said mirror to said base means;

a finger mounted for movement in accordance with said mirror;

U-shaped slot means secured to said base for receiving said finger therebetween;

adjustment means coacting between said finger and said U-shaped slot for limiting the movement of said finger within said U-shaped slot between a first and a second position; and

a solenoid connection for moving said mirror upon activation of said solenoid to tilt the mirror in accordance with the movement established for said finger.

4,105,302
AUTOMATIC REFRACTION APPARATUS AND METHOD

George W. Tate, Jr., 11127 Bushire, Dallas, Tex. 75229

Filed Jun. 23, 1976, Ser. No. 699,076
Int. Cl.[2] A61B 3/14, 3/10, 3/00
U.S. Cl. 351—7 12 Claims

1. Apparatus for measuring refractive error of a subject's eye comprising:

a subjective refraction system including:

a first optical system including display means for displaying test symbols, said first optical system being continuously variable over a range of powers through which the subject views the displayed test symbols;

first control means for setting said first optical system at any selected power setting within said range of powers; and

a manual response device operable by the subject for providing a plurality of output signals;

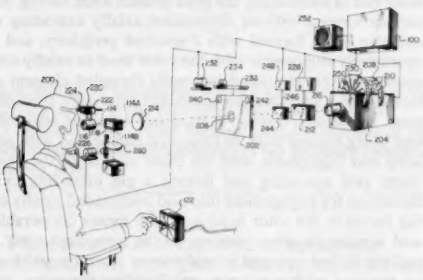
an objective refraction system including;

pattern generating means for generating an optical pattern;

a second optical system continuously variable over said range of powers through which said optical pattern is imaged on the retina of the subject's eye;

second control means for setting said second optical system at any selected power setting within said range of powers;

refraction measurement means adapted to view the



retinal image of the pattern through said second optical system and provide an output signal indicative of the total refraction of the eye and the second optical system; and

image quality measurement means adapted to view the retinal image of the pattern through said second optical system and to respond to contrast transmission effects in the image to provide an output signal indicative of the image quality; and

data processing system means coupled to said first and second control means, said display means, said manual response device, said refraction measurement means and said image quality measurement means and responsive to signals received from said response device, said refraction measurement means and said image quality measurement means to control said first and second control means to identically set the first and second optical systems at discrete settings of cylinder and spherical power which provide a refractive correction most desired by the subject which is consistent with refraction and image quality measurements.

4,105,303

METHOD FOR DETERMINING THE REFRACTIVE CORRECTION FOR AN EYE

David L. Guyton, 10833 Willowisp, Houston, Tex. 77035

Filed Jan. 5, 1977, Ser. No. 756,933

Int. Cl.[2] A61B *3/00*

U.S. Cl. 351—39 **7 Claims**

1. A method for determining the refractive correction for an eye including the steps of:

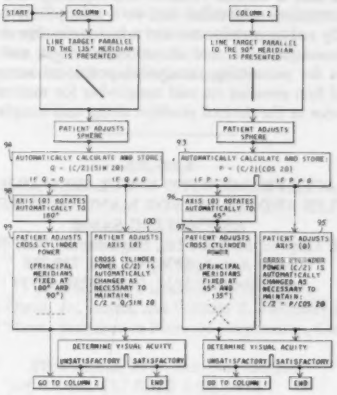
providing corrective optics between a patient's eye and a target location, said corrective optics comprising variable spherical optics in combination with variable astigmatic optics, said variable astigmatic optics being equivalent to a cross cylinder having variable power and variable orientation;

providing, in alternate succession, first and second straight line targets in said target location, said first straight line target having arbitrary meridional orientation without regard to any suspected principal meridian of the astigmatism of the patient's eye, and said second straight line target having meridional orientation substantially 45° away from the orientation of said first straight line target;

adjusting separately, for each of said straight line targets, both said variable spherical optics and said variable astigmatic optics to optimize the focus of the straight line target within the patient's eye;

wherein the improvement comprises:

allowing the initial power and orientation of said variable


START
COLUMN 1
COLUMN 2
LINE TARGET PARALLEL TO THE 135° MERIDIAN IS PRESENTED
LINE TARGET PARALLEL TO THE 90° MERIDIAN IS PRESENTED
PATIENT ADJUSTS SPHERE
AUTOMATICALLY CALCULATE AND STORE
IF Q = 0
IF Q ≠ 0
IF P = 0
IF P ≠ 0
AXIS (θ) ROTATES AUTOMATICALLY TO 180°
AXIS (θ) ROTATES AUTOMATICALLY TO 45°
PATIENT ADJUSTS CROSS CYLINDER POWER
(PRINCIPAL MERIDIANS FIXED AT 180° AND 90°)
PATIENT ADJUSTS AXIS (θ)
CROSS CYLINDER POWER (C/2) IS AUTOMATICALLY CHANGED AS NECESSARY TO MAINTAIN: C/2 = Q/SIN 2θ
(PRINCIPAL MERIDIANS FIXED AT 45° AND 135°)
CROSS CYLINDER POWER (C/2) IS AUTOMATICALLY CHANGED AS NECESSARY TO MAINTAIN: C/2 = P/COS 2θ
DETERMINE VISUAL ACUITY
UNSATISFACTORY
SATISFACTORY
GO TO COLUMN 2
END
GO TO COLUMN 1
END

astigmatic optics to have arbitrary values prior to the focusing of said first straight line target;

maintaining the power and orientation of said variable astigmatic optics at the successive adjusted values prior to the focusing of each successive straight line target;

and accomplishing the adjustment of said variable astigmatic optics for each of said straight line targets by adjusting both the orientation and the power of the variable astigmatic optics substantially simultaneously as necessary to maintain constant the dioptric power then acting in the meridian parallel to the orientation of the straight line target being focused;

whereby said refractive correction is determined.

4,105,304

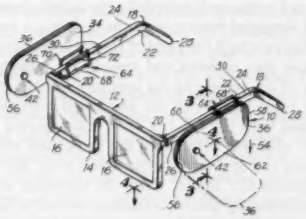
SIDE GLARE-ELIMINATING DEVICE FOR SECUREMENT TO EYEGLASSES AND OTHER SUITABLE MOUNTING STRUCTURES

Alfred Baker, 153 E. Central Ave., Pearl River, N.Y. 10965

Filed Nov. 8, 1976, Ser. No. 739,437

Int. Cl.[2] G02C *9/04*

U.S. Cl. 351—47 **37 Claims**



1. A side glare device for attachment to a selected temple-bar of eyeglass frames or other suitable mounting means,

said device comprising a first glare shield member and a second glare shield member, said first and second members being provided with overlapping surfaces for adjustment relative to each other along a common plane to selectively vary the amount of light transmission towards the eyes of the wearer of said side glare device,

means for coupling said first and second members with respect to one another to permit relative positioning of said second member with respect to said first member along said common plane,

said coupling means being operable to permit movement of said second member with respect to said first member between a first relative superimposed coextensive orientation and a second relative non-superimposed and non-coextensive orientation and to a multiplicity of substantially non-superimposed and non-coextensive orientations between said first and second orientations, and

means for permitting removable positional securement of said first member on said temple-bar for maintaining said device at the desired position along said temple-bar.

4,105,305

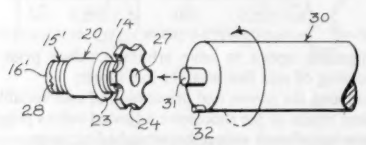
SPECTACLE FRAME WITH ANGULARLY ADJUSTABLE TEMPLES AND MEANS FOR MANUFACTURING AND ASSEMBLING SAME

Harry J. Lazarus, 36 Knox La., Englishtown, N.J. 07726

Filed Aug. 2, 1976, Ser. No. 710,788

Int. Cl.[2] G02C *5/14, 5/04;* B25B *27/14*

U.S. Cl. 351—111 **5 Claims**



1. In a spectacle frame of the type including a frontal lens support incorporating a nose bridge, a pair of temples, respective hinges connecting each temple to the respective outer end of the lens support, a socket formed in one of the lens support and the temple, adjacent at least one outer end of the lens support, an internally threaded element axially aligned with each socket, and an externally threaded adjusting number threadedly engaged in each internally threaded element and having an outer and engaging the other of the lens support and the temple at a point spaced outwardly from the axis of the associated hinge, with the internally threaded element having an axial length less than the depth of the associated socket with which it is axially aligned and having an outer end which is substantially flush with the surface of that one, of the lens support and the temple, formed with the associated socket, and with the externally threaded adjusting member being constituted by a threaded rotor having an operating head on its outer end and a threaded stem extending inwardly from the head and threadedly engaged through the associated internally threaded element, and with each internally threaded element and the associated threaded rotor conjointly defining a temple adjusting assembly in which the head of the rotor is engaged with the other of the lens support and temple for adjustment of the angularity of the temple to the lens support by rotation of the associated rotor relative to the associated internally threaded element, and with the head of each rotor having a periphery formed for effecting rotation of the associated rotor by a person wearing the spectacle frame, each rotor having an axial length substantially longer than the threaded length of the associated internally threaded element whereby the rotor has a telescopic relation with the associated internally threaded element: the improvement comprising each rotor, after telescopic assembly into its associated internally threaded element having the inner end of its threaded stem formed with limiting means limiting outward movement of the rotor relative to the associated internally threaded element to a position in which the rotor remains threadedly engaged in the associated threaded element; the head of each rotor limiting inward movement of the rotor, relative to its associated internally threaded element, to a depth less than the depth of the associated socket; each internally threaded element having an area of surface engagement with that one, of the lens support and the temple, having the socket formed therein sufficient to stabilize the internally threaded element to maintain the internally threaded element in accurate axial alignment with the associated socket by resistance to off-axis stresses imposed on the internally threaded element during operation of said adjusting assembly to adjust the angularity of the temple to the lens support; each rotor being movable, by rotation thereof, through an axial distance very substantially greater that the axial extent of the threads of the associated internally threaded element before the rotation is limited by engagement of said limiting means with a portion of the associated internally threaded element spaced axially a substantial distance from the inner end of said socket; the head of each rotor having its outer surface formed with an unthreaded axially extending recess, and also being formed with a notched periphery; and a tool operatively engageable with the rotor head to axially align the rotor with the associated internally threaded element and to thread the rotor into the associated internally threaded element, by rotation thereof, to form said adjusting assembly; said tool being formed with an elongated handle and with an operating end engageable with the outer surface of the head of a rotor; said operating end having a pin extending centrally therefrom for engagement into said unthreaded axially extending recess in the rotor head and with means cooperable with said notches to effect rotation of the associated rotor, when said pin is thus engaged in said recess; whereby said tool may be engaged with a rotor to axially align the rotor with the associated internally threaded element and then to rotate the rotor to thread it through the associated internally threaded element to form said adjusting assembly, after which the inner end of the stem of the associated rotor is formed with said limiting means limiting outward movement of the rotor relative to the associated internally threaded element to maintain the rotor constantly threadedly engaged through the associated internally threaded element; said tool thereafter being operable to have said adjusting assembly mounted thereon, through engagement of said pin into said rotor recess, whereby said adjustment assembly may be accurately guided in accurate axial alignment with the associated socket during assembly of the adjusting assembly with that one, of the lens support and temple, having said socket formed therein.

4,105,306

SOUND MOVIE PROJECTOR

Jihaciro Utsumi, Yokohama, Japan, assignor to Bell Ko-On Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1975, Ser. No. 571,064

Int. Cl.[2] G03B *31/02*

U.S. Cl. 352—14 **9 Claims**

1. A sound movie projector which comprises:

(a) a first sprocket,

(b) an intermittent film advancing mechanism for advancing the film on a frame-by-frame basis at a projection gate,

(c) a sound recording and/or reproducing head assembly,

(d) a film drive roller assembly,

(e) a second sprocket,

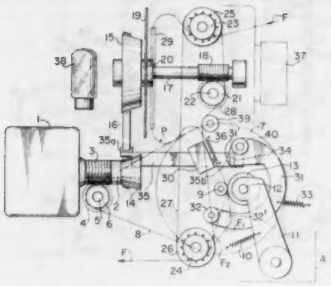
elements (a) (b) (c) (d) (e) being disposed serially along a film threading path defined between the two sprockets,

(f) a pivotally mounted sensing lever, for measuring film length, operatively engaged with said film at a position interposed between the film drive roller assembly and the second sprocket, said film interposed between said film drive roller assembly and said second sprocket normally having a substantially rectilinear configuration,

(g) a driving motor,

(h) a stepless transmission mechanism, composed of two cone pulleys and a belt disposed therearound, for transmitting the rotation of the driving motor,

(i) a first drive mechanism which drives, by means of the output of the stepless transmission mechanism, the first sprocket, the intermittent film advancing mechanism, and the second sprocket,



(j) a second drive mechanism which transmits rotation of the driving motor to the film drive roller assembly, and

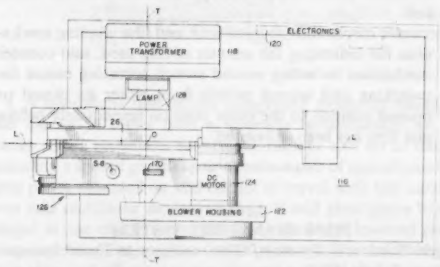
(k) a displacing mechanism for displacing the position of the belt in response to displacement of the pivotally mounted sensing lever.

4,105,307

PROGRAMMABLE VIEWING SYSTEM FOR PROCESSING AND VIEWING CASSETTE CONTAINED PHOTOGRAPHIC FILM STRIPS

William A. Holmes, Marblehead, and Donald T. Scholz, Wayland, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,425
Int. Cl.[2] G03B *23/02, 31/02*
U.S. Cl. 352—72 20 Claims



1. In a programmable viewing system for a photographic film strip contained in a cassette during exposure, processing and viewing, the combination comprising:

a chassis defining an optical center at the intersection of mutually perpendicular longitudinal, transverse and horizontal planes, said chassis including a plate-like central support generally parallel to said longitudinal plane, said central support being an integral casting having an elevated first portion cantilevered forwardly of said transverse plane from a standard portion positioned rearwardly of said transverse plane;

a cassette well defined by said central support to position a cassette in registry with said optical center for processing, projection and rewinding of the film strip contained therein;

a plurality of cassette engaging components carried by said support for movement relative to said cassette well and cooperative with the cassette during the respective processing, projecting and rewinding of the film strip;

a programming cam disc rotatably carried by said central support on an axis perpendicular to said longitudinal plane;

a pair of shiftable members carried one on each side of said central support to position said cassette engaging components in response to angular orientation of said programming cam disc;

a projection lamp supported to one side of said central support on an axis defined by the intersection of said transverse and longitudinal planes and a projection lens carried by said elevated first portion of said central support below said optical center on an axis defined by the intersection of said longitudinal and transverse planes; and

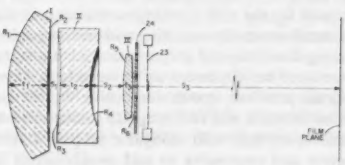
a rotatable shutter supported from said casting between said cassette well and said projection lamp.

4,105,308

ASPHERIC PLASTIC TRIPLET

R. Calvin Owen, Jr., Acton, and William T. Plummer, Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,260
Int. Cl.[2] G02B *3/04, 9/14*
U.S. Cl. 350—189 10 Claims



1. A single element adjustable focus photographic lens system for use in camera apparatus comprising:

a single lens element defining an optical axis therethrough and having a high optical power of at least more than twice the optical power of said photographic lens system, said single lens element also including a strong aspheric surface thereon to correct low order aberrations and particularly low order sperical aberrations directly associated therewith;

optical means comprising at least two lens elements disposed along said optical axis in spaced apart optical alignment with respect to said single lens element; and

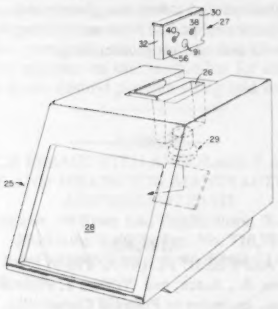
adjustable focusing means for retaining said single lens element and said lens means in spaced apart optical alignment with respect to each other and for changing the spacing between said single lens element and said optical means along said optical axis to alter the focus of said lens system in response to an adjustment of said focusing means while simultaneously maintaining a fixed determinate spacing between said lens elements of said optical means, said strong aspheric surface operating to maintain a balance in the correction of low order aberrations and particularly low order spherical aberrations directly associated with said single lens element as said spacing between said single lens element and said lens optical means along said optical axis is altered to effect a change in focus over a wide focus scale.

4,105,309

LOGIC SYSTEM FOR PHOTOGRAPHIC FILM STRIP HANDLING APPARATUS

Donald T. Scholz, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,412
Int. Cl.[2] G03C *11/00*
U.S. Cl. 352—130 8 Claims



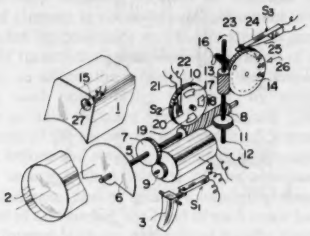
1. Apparatus for use with a cassette containing an elongated strip of material; means for receiving said cassette; drive means for advancing the elongated strip of material; a programming member mounted for displacement between first, second, and third program positions; means responsive to said programming member being in said first program position to cause said drive means to advance said elongated strip of material in a first direction and responsive to said programming member being in said second position to advance said elongated strip of material in a second direction; means to displace said programming member between said program positions proceeding from said first program position to said second program position, from said second program position to said third program position, and from said third program position to said first program position; means defining first and second cam follower tracks carried by said programming member; a cam follower operable to engage said first track or said second track as said programming member is advanced to said third program position; ejecting means operable by said cam follower to eject said cassette from said cassette receiving means; said first track being contoured to guide said cam follower to actuate said ejecting means to eject said cassette from said cassette receiving means when said programming member is advanced to said third program position; said second track being contoured to guide said cam follower in a manner to fail to actuate said ejecting means to eject said cassette from said cassette receiving means when said programming member is advanced to said third program position; and eject control means to selectively switch said cam follower from said first track to said second track at a given position of said programming member in its displacement from said first program position to said third program position whereby said programming member will advance from said second program position through said third program position without ejecting said cassette when said cam follower has been switched to said second track.

4,105,310

INDICATING DEVICE FOR MOTION PICTURE CAMERA

Hiroshi Hirata, and Takashi Kondo, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 6, 1976, Ser. No. 747,697
Claims priority, application Japan, Dec. 24, 1975, 50-175649
Int. Cl.[2] G03B *1/60*
U.S. Cl. 352—171 8 Claims



1. In a motion picture camera including a camera housing, an electric motor, a film winding mechanism coupled with said motor to be driven for winding-up a film, and a shutter coupled with said motor to be driven for exposure of said film, an indicating device comprising:

indicating means including a first light emitting element disposed on said camera housing such that energization thereof can be recognized by a person to be photographed;

a power-supplying circuit for energizing said indicating means, said power-supplying circuit including first and second switches connected in parallel with each other for supplying electric power to said first light emitting element;

first switch actuating means coupled with said film winding mechanism for repeatedly switching said first switch from its closed position to its opened position and vice versa; and

a counter mechanism coupled with said film winding mechanism for indicating the amount of film used, said counter mechanism including second switch actuating means for switching said second switch from either its closed or opened position to the other position immediately before said film has been exhausted.

4,105,311

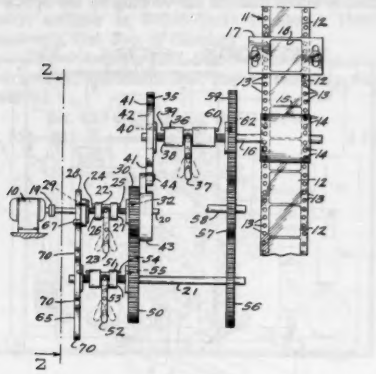
FILM TRANSPORT SYSTEM

Angelo Boudouris, Sylvania, Ohio, assignor to Eprad Incorporated, Toledo, Ohio

Filed Nov. 8, 1976, Ser. No. 739,465
Int. Cl.[2] G03B *1/24*
U.S. Cl. 352—187 4 Claims

1. An improved transport for moving film through a gate in a motion picture projector comprising, in combination, a film engaging sprocket mounted on a drive shaft, a motor, first gear means having an intermittently rotated output for a continuously rotated input, first clutch means for selectively connecting and disconnecting said first gear means between said motor and said drive shaft, said motor intermittently rotating in one direction said drive shaft through said first gear means when said first clutch means is connected for intermittently pulling the film through the gate, second gear means having a continuously rotated output for a continuously rotated input, and second clutch means for selectively connecting and disconnecting said second gear means between said motor and said drive shaft, said motor continuously driving in an opposite

direction said drive shaft through said second gear means when said second clutch means is connected for pushing the



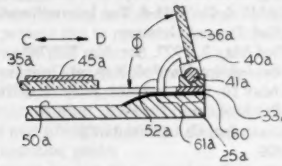
film continuously back through the gate during rewind of the film.

4,105,312

CARRIAGE MECHANISM FOR MICROFICHE READER

Thomas R. Wells, Des Plaines, Ill., and Theodore E. Dahlen, West Bend, Wis., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jun. 28, 1976, Ser. No. 700,676
Int. Cl.[2] G03B *23/08*
U.S. Cl. 353—27 R 7 Claims



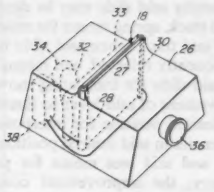
1. A microfiche film carrier comprising means for enabling said carrier to travel over a mutually perpendicular set of tracks with a rectilinear movement, each of said set of tracks including a spaced parallel pair of rails, a pair of spaced parallel glass plates mounted on said carrier to travel with said carrier over said rectilinear movement, one of said glass plates being hinged at one end to move between raised and lowered positions, operator finger means rigidly attached to said hinged glass plate and effective at one extremity of said movement for automatically lifting one of said glass plates, and cam means intermediate said rails forming one set of tracks with an inclined plane followed by a flat horizontal guide portion for guiding and directing said operator finger on said glass plate as it raises and lowers on said hinge, said inclined plane cooperating with said finger to raise said glass plate, said flat horizontal guide portion cooperating with said operator finger for enabling said glass plate to stand in a stable, substantially upright, slightly leaning position, with the center of gravity resting near said hinge, said glass plate standing stably as it moves along the entire length of the flat horizontal guide portion independently of the exact amount of said movement near the extremity of said movement, whereby the weight of said leaning plate rests upon and is supported by said hinge and the tip of said finger with the center of gravity of said glass plate resting close to said hinge, and on the side of said hinge where said finger is located.

4,105,313

DUAL PURPOSE PHOTOGRAPHIC DISPLAYS

Gerald Altman, 41 Westminster Rd., Newton, Mass. 02159

Division of Ser. No. 468,441, May 9, 1974, Pat. No. 3,989,356, and a continuation-in-part of Ser. No. 446,274, Feb. 27, 1974, which is a continuation-in-part of Ser. No. 225,187, Feb. 10, 1972, Pat. No. 3,892,884, which is a continuation of Ser. No. 734,039, Jun. 3, 1968, abandoned, which is a continuation-in-part of Ser. No. 655,714, Jul. 6, 1967, abandoned. This application Oct. 27, 1976, Ser. No. 736,249
Int. Cl.[2] G03B *21/06*
U.S. Cl. 353—65 21 Claims



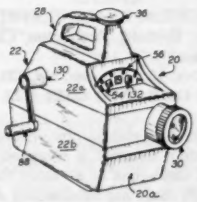
1. A photographic projection system comprising light source means, projection station means defining a projection field, mechanical guide means for constraining motion of a photographic print into and out of said projection field, said photographic print having visual image stratum means and light control stratum means, said light control stratum means being chaaracterized by incremental discontinuities in refractive index at a first energy level by which diffuse scattering of visible light occurs and by incremental continuity in refractive index at a second energy level by which specular transmission of visible light occurs, said photographic print when outside of said projection system being at said first energy level whereby said visual image stratum is observable in scattered light, energy control means for imparting to said photographic print, when in said mechanical guide means, said second energy level whereby said light control stratum is substantially clear, and objective lens means for focusing light emanating from said light source means and directed through said projection field on a viewing screen.

4,105,314

HAND CRANK GENERATOR-POWERED ROTARY SLIDE PROJECTOR

Alexander W. Hughes, Jr., 19 Wardell Circle, Oceanport, N.J. 07757

Filed Jan. 18, 1977, Ser. No. 760,294
Int. Cl.[2] G03B *21/20, 23/10;* H02K *7/10*
U.S. Cl. 353—85 10 Claims



1. In a projector having a housing, a frame mounted in said housing, said frame having means therein defining an upwardly open pocket for removably receiving a transparency carrying disc therein having perforations for cooperation with feeding means and having evenly spaced circumferentially arranged transparencies mounted therein, a feeding lever pivotally mounted in said frame for partial rotation about an axis coincident with the center of the disc and having means thereon for

successively engaging the perforations in said disc to bring the transparencies mounted in said disc to a desired position, said housing further comprising a source of illumination mounted therein for enabling illumination of said transparency when it is in said desired position and a lens means for projecting an image of said illuminated positioned transparency, said frame being interposed between said illumination source and said lens means, said projector further comprising means on said frame defining a track extending in a plane parallel to the plane of the received disc, said feeding lever comprising a slide, said slide comprising a portion engaged in said track whereby said slide is guided for sliding movement from end to end of said track, said slide further comprising an engageable portion projecting from said frame whereby said slide may be depressed toward the lower end of said track, spring means for returning the slide to the upper end of said track when said slide is engaged and depressed and subsequently released, and means interconnecting said lever and said slide for translating movement of said slide into rotary movement of said lever to thereby rotate said disc to a different desired position for interposing a different one of said transparencies in said desired position between said illumination source and said lens means for projecting said different transparency; the improvement comprising hand crank operated generator means mounted in said housing, said generator means comprising a stator coil means capable of having a current induced therein and a magnetic rotor means rotatable within said stator coil means for producing a changing magnetic field across said stator coil means due to said rotation for inducing said current therein, said stator coil means being electrically connected to said illumination source for providing said induced current to said illumination source for enabling said illumination of said positioned transparency, crank means mechanically connected to said rotor means for enabling said rotation thereof, and gear means drivingly connected to said rotor means for enabling simultaneous rotation therewith in response to rotation of said rotor means by said crank means, said gear means having a finger means mounted thereon for simultaneous rotation therewith, said finger means bearing gear means being mounted in said housing with said finger means being in mechanical alignment with said slide means engageable portion for depressing said slide upon engagement therewith as said gear means is rotated, said slide means engageable portion having means thereon for enabling said finger means to disengage from said slide means during rotation of said gear means as said slide means approaches the lower end of said track whereby said spring means may return said slide to said upper end for subsequent reengagement by said finger means upon completion of a cycle of rotation of said gear means for changing said positioned transparency, said rotation of said crank means both providing current to illuminate said positioned transparency as well as changing said positioned transparency to a different one of said transparencies.

4,105,315
MICROFILM READING SYSTEM

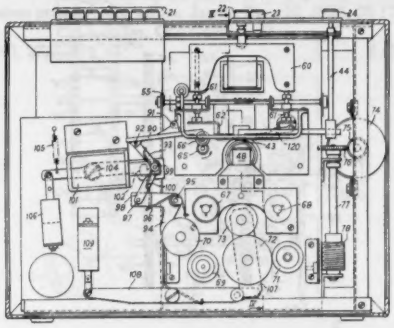
Ian Duncan Fraser, Delfield, Funtington, Chichester, Sussex PO18 96 G, England

Filed Oct. 12, 1976, Ser. No. 731,438

Int. Cl.[2] G09B *17/00*; G03B *1/22, 1/32*

U.S. Cl. 353—95 **5 Claims**

1. A microfilm reading system comprising a microfilm record in which reading material is arranged in one or more columns of lines of characters of no more than 26 characters per line and wherein there are illustrations at intervals interspersed with the lines of characters, viewing apparatus having an optical magnification system arranged to present an enlarged image of part of the length of a column to the reader in the appropriate orientation for reading, a drive system for imparting movement to the microfilm relative to the optical magnification system comprising first and second drive means, said first drive means operating to advance the microfilm record continuously and uninterruptedly relative to the optical system such as to enable the viewer to read the successive lines without shifting his eyes from line to line and, by virtue of the restricted length of each line, without lateral movement, and said second drive means being operable to rapidly move a illustration into a position for viewing by the optical system,



and sensing means operable to sense an illustration as it appears in one of the columns for effecting operation of said second drive means, said second drive means comprising a pull-down device.

4,105,316
FILM STRIP PROJECTION APPARATUS

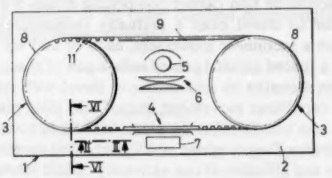
Bernward Söding, Munich, and Reinhard Freisleben, Pöring Post Zorneding, both of Fed. Rep. of Germany, assignors to Soding TV GmbH & Co. Bild & Ton International, Lochham bei Munich, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,797

Claims priority, application Fed. Rep. of Germany, May 10, 1976, 2620573; May 10, 1976, 2620564; May 10, 1976, 7614728; Aug. 30, 1976, 7627084; Aug. 30, 1976, 7627085

Int. Cl.[2] G03B *23/08*

U.S. Cl. 353—109 **20 Claims**



1. A film strip projector apparatus for the projection of a film strip, comprising:

a closed substantially circular path formed in said projector apparatus about which said film strip is driven,

an optical projection system disposed in said projector apparatus having a gate through which said film strip passes,

said film strip being open-ended and flexible and including longitudinally extending edge portions each including perforations,

said path including a pair of spaced apart and parallel conveyor belts mounted for circulation,

the spacing of said conveyor belts being substantially equal to the spacing of said perforated edge portions, and

said conveyor belts each including at least one lug for engaging said perforated edge portions to drive said openended film strip about said circular path.

4,105,317

CIRCULAR MAGAZINE FOR LINEAR MAGAZINE SLIDE PROJECTORS

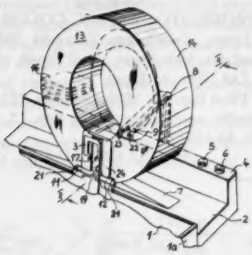
Reinhard Sobotta, Braunschweig, Mascherode, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,099

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 2640700

Int. Cl.² G03B *23/06*; B65D *85/48*

U.S. Cl. 353—117 **5 Claims**



1. A two-part circular magazine for a slide projector having a channel-shaped magazine guide extending parallel with a projection axis to accommodate a linear magazine, and a lifting ramp arranged in said magazine guide in the region of a slide change plane for lifting slides in a linear magazine to a predetermined height for transverse movement by a slide change device, said magazine including an annular rotor having slide storing compartments and an annular stator enclosing said rotor and having a radial slot for passage of a slide transversely relative to said magazine along a slide change plane, said magazine comprising:

a. said stator having an exterior formed in the region of said slide passage slot to provide a generally tangential groove opening to said rotor;

b. said groove having side walls configured to fit opposite sides of said lifting ramp;

c. said rotor having an exterior positioned directly over the top of said lifting ramp when said magazine is mounted in said magazine guide;

d. said stator having an inclined surface ascending toward said rotor from the region of said slot; and

e. said inclined surface extending from beneath said top of said lifting ramp up to the level of an interior surface of said rotor above said lifting ramp.

4,105,318

PINHOLE MICROFICHE RECORDER AND VIEWER

George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Filed May 30, 1974, Ser. No. 474,795

Int. Cl.² G03B *23/08*

U.S. Cl. 353—120 **3 Claims**

1. A microfiche adapted for use on a micro optical viewer, said microfiche including:

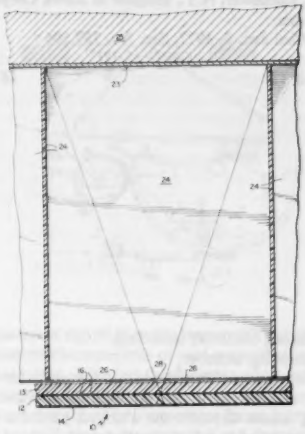
a. a transparent sheet,

b. one side of said sheet carrying stored micro optical information distributed over its area,

c. the other surface of said sheet being opaque except for a plurality of pinholes each of which functions as a lens, said pinholes positioned on a plane parallel to said stored information,

d. said micro optical information defined by a plurality of information sets, each information set corresponding to a unique macro scene, each information set occupying dispersed areas interlaced with but distinct from the dispersed areas occupied by any other information set, each unique macro scene corresponding to a unique set of pinholes, each of the dispersed areas of an information set having its own pinhole and being in optical correspondence therewith,

wherein each of the dispersed areas of an information set is itself defined by a triad of spaced-from-each-other optical



images, each of said spaced-from-each-other optical images being in optical alignment with a pinhole, each of said pinholes of each said triad being of different radii corresponding to different optical wavelengths.

4,105,319

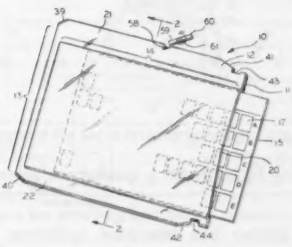
MICROFICHE CARRIER

Thomas R. Wells, Des Plaines, and Robert L. Kearney, Northbrook, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of Ser. No. 532,798, Dec. 16, 1974, Pat. No. 4,006,980. This application Jun. 28, 1976, Ser. No. 700,284

Int. Cl.² G03B *21/00, 23/12*

U.S. Cl. 353—120 **21 Claims**



1. A microfiche film carrier for use in a library file which supports a plurality of microfiche carriers in a spaced parallel side-by-side relationship, said carrier comprising: frame means having therein a window area with dimensions substantially corresponding to dimensions of a microfiche film, said carrier frame having opposed leading and trailing edges and side rails for supporting said microfiche when in a library file, means for mounting at least a microfiche film within said window area, the edges of said side rails forming areas to support said microfiche without thickness binding between said carrier and its adjacent supporting structure in a library file, and a concave contour means formed in the width dimension of said carrier on at least one of said leading and trailing edges for guiding and

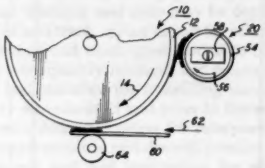
directing said carrier as it is inserted into or extracted from a library file.

4,105,320

TRANSFER OF CONDUCTIVE PARTICLES

Lloyd F. Bean, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 5, 1977, Ser. No. 757,106
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 TR **16 Claims**



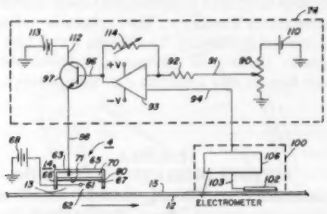
1. A reproducing machine, including:
a particle receiving member;
means for depositing charged conductive particles on said receiving member in image configuration wherein said depositing means deposits the charged particles on said receiving member in a first time interval; and
means for transferring the particles from said receiving member to a copy sheet in a second time interval less than the first time interval so as to control the charge exchange between the particles and the sheet to prevent repulsion of the particles from the sheet during the transfer of the particles thereto.

4,105,321

ILLUMINATED CHARGE CONTROL SYSTEM FOR XEROGRAPHIC MACHINES

Charles J. Urso, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 27, 1976, Ser. No. 736,033
Int. Cl.² G03G *15/02*
U.S. Cl. 355—3 CH **2 Claims**



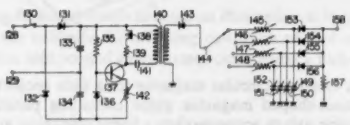
1. In an electrostatic type reproduction machine for producing copies of an original, the machine having a photoreceptor, means for charging the photoreceptor in preparation for imaging, exposure means for exposing the charged photoreceptor to the original whereby to create a latent electrostatic image of the original on the photoreceptor, developing means for developing the latent electrostatic image on the photoreceptor, and transfer means for transferring the developed image to a sheet of copy material, the combination comprising:
a. means for generating a charge level signal reflecting the charge level of said photoreceptor following charging by said charging means;
b. light means for illuminating said photoreceptor to reduce the charge level of said photoreceptor, said light means reducing the charge level on said photoreceptor in proportion to the intensity of the light produced by said light means; and
c. control means for regulating the intensity of said light means in response to said charge level signal, said light means comprising a constant light source, and variable light conducting means disposed between said light source and said photoreceptor, said control means including means for controlling the light transmissitivity of said light conducting means in response to said charge level signal.

4,105,322

ELECTROPHOTOGRAPHIC COLOR PROCESS

Motoichiro Inoue, Yokohama; Tsuyoshi Shiga, Urawa, and Nobuo Kasahara, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 10, 1976, Ser. No. 722,027
Claims priority, application Japan, Sep. 12, 1975, 50-111327; Sep. 12, 1975, 50-111328
Int. Cl.² G03G *15/01*
U.S. Cl. 355—4 **2 Claims**



1. An electrophotographic process comprising the steps of:
(a) uniformly charging the surface of a photosensitive member;
(b) irradiating said surface with actinic radiation which is passed through a color separation filter in accordance with the image of an original for forming an electrostatic latent image of said origina on said surface, which latent image corresponds to the actinic rays passing through the color separation filter;
(c) bringing an electrostatic latent image receptive sheet into contact with the surface of the photosensitive member on which the latent image is formed for transferring the latent image thereon onto the receptive sheet;
(d) developing the transferred latent image with a developer which is chosen in dependence on the filter used in step (b); and
(e) repeating the described series of steps with different filters and with developers of corresponding colors, for producing a color copy; wherein the improvement comprises:
(f) applying a bias voltage containing a high frequency component across the photosensitive member and the receptive sheet during each of the repeated steps of transferring the latent image from the photosensitive member to the receptive sheet; and
(g) sequentially switching the high frequency component of the bias voltage to an optimum frequency for each color by selectively applying said bias voltage across respective capacitive time constant circuits during each repeated step for uniformly transferring each of said latent images.

4,105,323

PROCESS AND APPARATUS FOR RECORDING DEFORMATION IMAGES

Roland Moraw, and Günther Schädlich, both of Naurod, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 12, 1976, Ser. No. 666,406
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2510910
Int. Cl.² G03G *15/00*
U.S. Cl. 355—9 **11 Claims**

1. Apparatus for recording images by deformation on the

surface of a recording material including a flexible transparent support layer, and a photoconductive thermoplastic recording layer, comprising

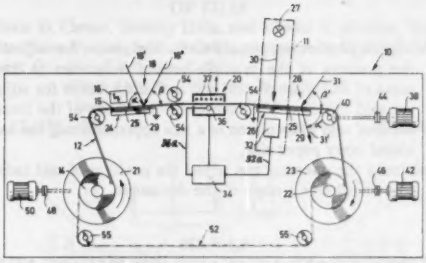
(a) charging means for electrostatically charging the recording material;

(b) exposure means for applying an image to the recording medium;

(c) transport means for continuously transporting the recording material from a supply reel to a take-up reel via, in succession, said charging means and said exposure means;

(d) first guide means for stabilizing the recording material during the transport thereof through said exposure means, said first guide means including a stationary conductive layer having a given potential and arranged opposite said charging and exposure means, whereby the electrostatically charged recording medium is drawn by attraction toward said conductive layer;

(e) second guide means for stabilizing the recording material against lateral displacement during the transsport thereof between said supply and take-up reels, said second guide



means including guide roller means over which the recording material is transported, at least one of the guide roller means including a pair of spaced continuous lateral flanges between which the recording material is transported;

(f) stationary third guide means for stabilizing the recording material during the transport thereof between said second guide means and said take-up reel, said third guide means including a conductive layer having a given potential, whereby the electrostatically charged recording material is attracted to the conductive layer of said third guide means during continuous transport of the recording material thereby; and

(g) means supporting each of said first and third guide means for adjustment relative to the recording material, said support means including first support means for pivoting one of said first and third guide means about an axis parallel with the recording material and normal to the direction of transport of said recording material, and second support means supporting said first support means for transport in a direction normal to the recording material.

4,105,324

ELECTROPHOTOGRAPHIC APPARATUS HAVING COMPENSATION FOR REST-RUN PERFORMANCE VARIATIONS

Kenneth F. Seil, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 621,914, Oct. 14, 1975, abandoned. This application Jan. 12, 1977, Ser. No. 758,534

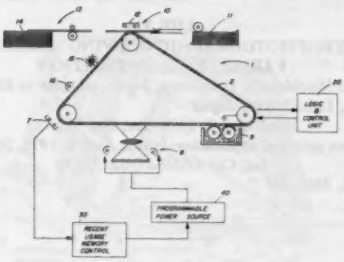
Int. Cl.[2] G03G *21/00*

U.S. Cl. 355—14 **6 Claims**

1. In electrophotographic apparatus of the type using a photoconductive insulative member and including charging, exposing and developing stations which are energized and function cyclically during a usage period in production of copies and which are non-energized during non-usage periods between copy production; the improvement comprising:

(a) means responsive to the cyclic function of said apparatus for storing the usage/non-usage history of said apparatus during a recent interval preceding a given copy cycle;

(b) means, responsive to said storing means, for providing an



adjustment signal in accordance with the rest-run/speed-variation characteristic of said apparatus; and

(c) means for adjusting the function of at least one of said stations during said given copy cycle in response to said adjustment signal to compensate for an increase in apparatus speed during a usage period and decrease in apparatus speed after a non-usage period.

4,105,325

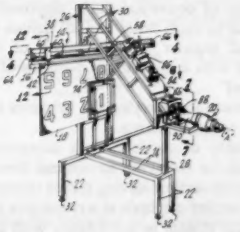
MICROPLATE SYSTEM

John D. McCollough, 10715 Rochester Ave., Los Angeles, Calif. 90024

Filed May 18, 1977, Ser. No. 798,123

Int. Cl.[2] G03B *27/44*

U.S. Cl. 355—54 **15 Claims**



1. An apparatus for use in making printing plates comprising:

a support;

hanger means for holding a flat sheet of photo-sensitive material;

track means for attaching said hanger means to said support while permitting horizontal and vertical movement thereof;

first transport means for moving said hanger means along said track means in a first direction in discrete steps of predetermined length, said first transport means comprising a plurality of fluid-actuated telescoping cylinders connected end to end;

second transport means for moving said hanger means along said track means in a second direction perpendicular to said first direction, whereby said hanger means and said sheet are capable of assuming a plurality of predetermined exposure positions in response to actuation of said first and second transport means, each of said exposure positions corresponding to a single page of a book in accordance with a signature format;

control switch means for actuating said cylinders of said first

transport means and for actuating said second transport means; and

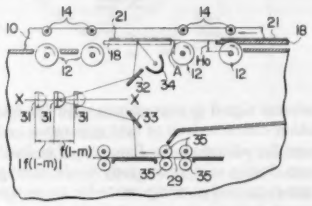
projection means for enlarging and projecting a prerecorded image from a transparency onto an exposure area of said sheet comprising a light source, a condenser lens, and an image forming lens.

4,105,326

ELECTROPHOTOGRAPHIC COPYING MACHINES OF VARIABLE MAGNIFICATION

Hideaki Mochimaru, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 9, 1976, Ser. No. 712,713
Claims priority, application Japan, Aug. 9, 1975, 50/97026
Int. Cl.² G03B *27/52, 27/70*
U.S. Cl. 355—55 **2 Claims**



2. An electrophotographic copying machine of the variable magnification type comprising:

an optical system; and

means for moving both an original and a photosensitive member with respect to said optical system during which an image of the original is focussed onto the photosensitive member through the optical system;

the improvement wherein said moving means comprises:

conveyor means for transporting originals comprising a plurality of conveyor shafts disposed in parallel relationship to each other and all driven for rotation at a selected angular velocity, each of the shafts being formed with a plurality of portions of different diameters; and

carrier means for carrying the originals on said conveyor means and comprising:

a plurality of carriers, each comprising a receptacle means for receiving an original thereon; and

respective carriers having means thereon for supporting the carried originals at a respective distance from the optical system in accordance with a respective magnification, said supporting means comprising a pair of guide members respectively attached to opposite sides of said receptacle means, and each guide member comprising an elongated member having means thereon for cooperatingly engaging said conveyor means for transportation thereby, said cooperatingly engaging means comprising means for engaging a respective diameter portion of said conveyor shafts.

4,105,327

MULTIPLE REDUCTION INDICATORS FOR CONTINUOUSLY VARIABLE REDUCTION COPIER MACHINES

David Kent Gibson; Myrl J. Miller, both of Boulder, and Spencer Allan Snell, Lyons, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

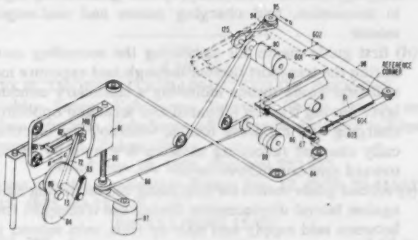
Filed Dec. 9, 1976, Ser. No. 749,137
Int. Cl.² G03B *27/36, 27/38*
U.S. Cl. 355—59 **5 Claims**

1. A document copier machine capable of continuously variable reduction of documents to a plurality of copy paper sizes, comprising:

a glass platen upon which said document to be copied is placed;

an optics system for directing illumination from said document to produce an image thereof for transfer to a selected size of copy paper;

a plurality of sets of operator-viewable, movable reduction indicators, each set associated with a particular copy paper size; and



an optics positioning system including means for adjusting the position of the multiple sets of indicators to frame areas of said glass platen, and including means for adjusting said optics system to provide an image of the framed areas of said glass platen in a size approximating the associated copy paper size,

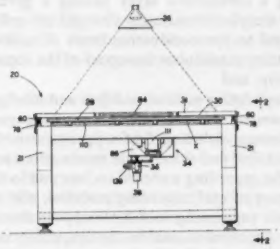
whereby the operator can adjust the position of said indicators to achieve a copy of the document.

4,105,328

METHOD OF AND APPARATUS FOR MANIPULATING LINE WEIGHT IN AN IMAGE

Joe R. Wasson, Boulder Creek; Joseph R. Pressley, Menlo Park; Robert W. Baker, Newark; Joseph H. Fairaizl, San Jose, and Richard J. Zorker, Santa Clara, all of Calif., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 29, 1976, Ser. No. 700,701
Int. Cl.² G03B *27/68, 27/02*
U.S. Cl. 355—78 **16 Claims**



1. An apparatus for precisely manipulating line weight in an image, comprising:

first means including a stationary frame member for supporting an image carrier;

second means including a mobile table for supporting a light-sensitive film parallel to and adjacent said image carrier;

third means for causing relative orbital movement between said film and said image carrier to cause uniform and undistorted spreading of image lines projected onto said film during an exposure as a result of an integral stepwise change of orbital diameter of said orbital movement, said third means including a horizontal platform supporting said mobile table, rotary bearing means being disposed

between said table and said platform to permit rotation of said platform relative to said table; and rotor means for orbiting said table by rotating said platform about an axis of rotation thereof, a displacement of said axis of rotation of said platform with respect to an axis of rotation of said rotor means being determinative of orbit diameter;

restraining means for preventing rotation of said mobile table during rotation of said rotor means, said restraining means including first shaft means secured to said table; second shaft means secured to a stationary support, said second shaft means being orthogonal to said first shaft means; and a carriage disposed between and maintained in contact with said first and second shaft means, movement of said table being thereby limited to rectilinear movement; and

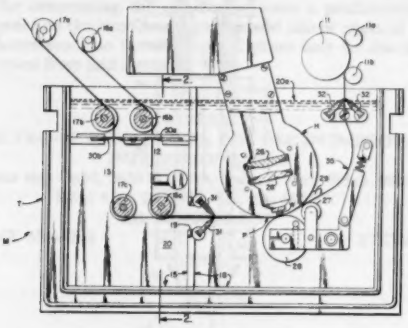
stepping motor means for controlling said stepwise change of orbital diameter to occur in a linear manner.

4,105,329

TOTAL IMMERSION TRANSFER OF PHOTOGRAPHIC IMAGES BETWEEN SPROCKET-REGISTERED STRIPS OF FILM

William D. Carter, Beverly Hills, and Martin S. Mueller, Rancho Palos Verdes, both of Calif., assignors to Carter Equipment Co., Inc., Lawndale, Calif.

Filed Apr. 26, 1977, Ser. No. 791,135
Int. Cl.[2] G03B *27/02, 27/10, 27/20*
U.S. Cl. 355—91 **15 Claims**



2. The method of claim 1 which includes the additional step of continuously wiping the optical surfaces of both strips of film, after they are submersed within the liquid and before their arrival at the printing sprocket, so as to remove foreign particles and air bubbles therefrom.

4,105,330

PHOTO PRINTING APPARATUS

Richie Conrad Hilton, 2/25 Noble Street, Allawah 2218, N.S.W., Australia

Continuation-in-part of Ser. No. 530,051, May 1, 1975, abandoned. This application Sep. 20, 1976, Ser. No. 724,420
Int. Cl.[2] G03B *27/06*
U.S. Cl. 355—102 **7 Claims**

1. Photoprinting apparatus, comprising:

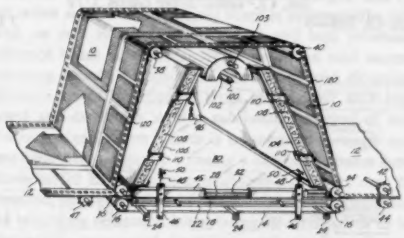
a housing means (20, 22, 24);

an endless carrier band (14) roller-supported in said housing means for unidirectional motion in a fixed plane established by an underlying platen (18, 22);

an endless negative copy band (10) roller-mounted in said frame above said carrier band (14) for unidirectional travel in a closed path, a portion of which is superposed to a carrier band;

rotary means for advancing a strip of photosensitive material (12) interposed between said carrier band (14) and said copy band (10) to form within said frame a sandwich assembly, said means being operable to simultaneously advance the elements of said sandwich assembly in said fixed plane;

downward-acting weighted transparent means (28, 30) within said frame and bearing on said sandwich to provide intimate contact between the elements of said sandwich above said platen (18, 22); and



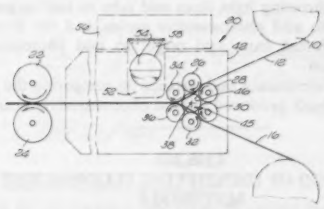
a source of intense light rays above said transparent means operable to expose said photosensitive material (12) through said weighted transparent means and said negative copy band (10) to impress said photosensitive material (12) with photographic images.

4,105,331

VACUUM HEAD FOR FILM

Charles E. Wallace, Palos Verdes, and Donald J. Farmer, Pacific Palisades, both of Calif., assignors to Extek Microsystems, Inc., Van Nuys, Calif.

Filed May 26, 1977, Ser. No. 800,764
Int. Cl.[2] G03B *27/10, 27/02*
U.S. Cl. 355—103 **10 Claims**



1. In an apparatus for copying of transparent film images from a moving continuous strip master to a moving continuous strip duplicate, including an exposure zone containing a light source for irradiating said master and said duplicate and means for positioning said master and duplicate during said continuous movement, the improvement according to which said positioning means comprises:

a housing;

means for insertion of said master into said housing;

means for insertion of said duplicate into said housing;

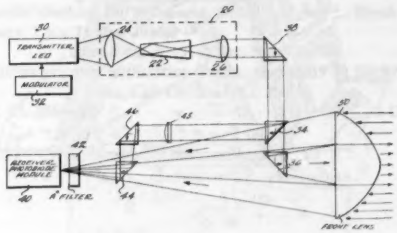
means for removal of said master and duplicate from said housing with confronting longitudinal surfaces of said master and duplicate in substantially continuous contact; and,

means for accomplishing relatively low pressure within said housing, both between said confronting surfaces and on surfaces of both said master and said duplicate which are opposite said confronting surfaces, compared to pressure outside said housing whereby as said master and duplicate pass from said housing, non-sliding contact between said confronting longitudinal surfaces is maintained by the pressure outside said housing on said surfaces at least until said contacting surfaces pass through said exposure zone.

4,105,332
APPARATUS FOR PRODUCING A LIGHT BEAM HAVING A UNIFORM PHASE FRONT AND DISTANCE MEASURING APPARATUS

Walter Hohne, Lewisburg, and Robin H. Hines, Tullahoma, both of Tenn., assignors to Precision International, Inc., Tullahoma, Tenn.

Filed Mar. 14, 1977, Ser. No. 777,441
Int. Cl.[2] G01C *3/08*; G02B *5/14*
U.S. Cl. 356—5 **7 Claims**



1. An apparatus for measuring the distance between the apparatus and a remote target comprising:

a source of light;

an optical transmitting system including a tube for receiving at an input light from said diode within a given solid angle and an output, said tube having internal light reflecting surfaces which diverge from each other in the direction from input to output so that light entering at greater than a predetermined angle is reflected from said surfaces to minimize the non-uniform phase front, and increase the power;

means for modulating the light emitted from said diode;

photosensitive means for producing an electrical signal in response to incident light;

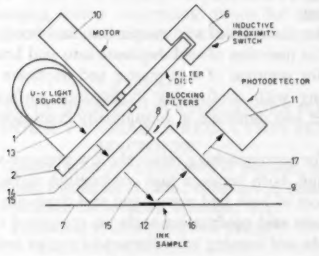
means for directing light from said tube to said target and directly to said photosensitive means and for directing light reflected from said target to said photosensitive means; and

means for determining said distance by comparing the phase of the signals produced by said photosensitive means.

4,105,333
METHOD OF IDENTIFYING FLUORESCENT MATERIALS

Wittich Kaule, and Gerhard Stenzel, both of Munich, Fed. Rep. of Germany, assignors to G.A.O. Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany

Filed Oct. 4, 1976, Ser. No. 729,021
Claims priority, application Austria, Oct. 17, 1975, 7944/75
Int. Cl.[2] G01N *21/52*
U.S. Cl. 356—85 **17 Claims**

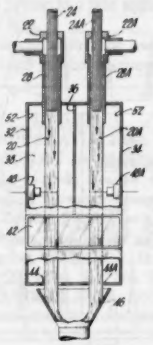


1. In a method of identifying fluorescent materials which are excited into fluorescence with light of respectively differently damped spectral radiant intensities, and in which a wide-band-radiating light source whose spectrum is selectively damped over a wide band and partially is used to irradiate the fluorescent materials, the different radiant intensities emitted by the fluorescent materials are compared, and such comparison is used for identification of a selected fluorescent material; the improvement comprising the steps of providing a neutral filter uniformly damping the radiation of said light source; providing a respective partially absorbing filter damping only the wavelengths necessary to excite the fluorescence of a selected fluorescent material; interposing said filters in the path of light rays directed from said light source onto a sample to be checked for the presence of a selected fluorescent material; measuring the respective intensities of radiation of the sample effected by said neutral filter and by each partially absorbent filter; and converting the measured intensities of radiation into output signals indicative of the presence or absence of the selected fluorescent material.

4,105,334
OPTICAL DETECTOR

Richard A. Halko, Flanders, and John J. Heigl, Short Hills, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 9, 1976, Ser. No. 712,536
Int. Cl.[2] G01N *21/00*
U.S. Cl. 356—104 **17 Claims**



1. Apparatus for use in detecting a selected physical property of a flowing liquid stream comprising: a chamber having first inlet means for receiving a sample of said stream and passing said sample as a freely falling stream through said chamber; optic means for internally illuminating the freely falling sample in a substantially axial direction of flow as it passes through said chamber, whereby the light from said optic means will scatter as a function of said property; and means disposed relative to the scattered light for enabling detection of said property of said freely falling stream.

4,105,335
INTERFEROMETRIC OPTICAL PHASE DISCRIMINATION APPARATUS

Nobuyoshi Tanaka; Naoki Ayata, both of Yokohama; Mitsuo Takeda; Susumu Matsumura, both of Kawasaki, and Kazuya Matsumoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

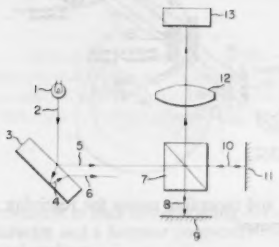
Continuation of Ser. No. 698,681, Jun. 22, 1976, abandoned. This application Jul. 6, 1977, Ser. No. 813,298
Claims priority, application Japan, Jun. 28, 1975, 50/80635
Int. Cl.[2] G01B *9/02*; G02B *21/06*
U.S. Cl. 356—108 **11 Claims**

1. An interferometric optical phase discrimination apparatus comprising:

a source of broadband radiation emitted within a predeter-

mined spectrum for illuminating a specimen having first and second surfaces;

an interferometer to which two wave fronts coming from said first and second surfaces are directed, said interferometer having beam splitter means, tilting means and beam direction means so that said two wave fronts are each split by said beam splitter means, whereafter two of the wave fronts split by said beam splitter means are tilted by said tilting means with respect to the other two wave fronts



split by said beam splitter means and all of said four split wave fronts are directed to an interference surface by said beam direction means, whereby an interference pattern appears on said interference surface; and

scanning means for scanning said interference pattern and for determining the distance between a predetermined point on the interference pattern and one of peaks of the interference so that the optical phase may be discriminated from said distance.

4,105,336

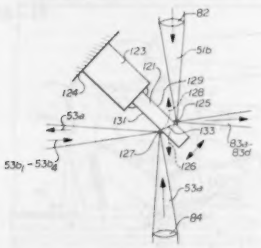
ELECTRO-OPTICAL DEVICE FOR USE IN IMPROVED INTERFEROMETERS

Charles Ray Pond, 2630 S. 288th, Federal Way, Wash. 98003

Filed May 25, 1976, Ser. No. 690,034

Int. Cl.² G02B 9/02

U.S. Cl. 356—113 **17 Claims**



1. A device for use in an interferometer, in which said interferometer an incident signal beam and an incident reference beam are produced by a common source, wherein in operation of the interferometer, the incident signal beam is directed to a target and then reflected therefrom as a returning signal beam and the incident reference beam is transmitted to the target or reference element and reflected therefrom as a returning reference beam, said device comprising:

a. plate-like means of light transmitting material;

b. means supporting said plate-like means in an operative position in the interferometer, in which position the incident signal beam and the returning signal beam are incident on one exterior face of said plate-like means, and the returning reference beam is incident on the opposite exterior face of said plate-like means; and

c. first and second reflecting means positioned on the opposite exterior faces of said plate-like means in such a manner relative to each other and having such a configuration relative to the size of the areas on said plate-like means over which the incident signal beam, the returning signal beam, and returning reference beam are incident, that (1) when the incident signal beam is substantially centered on said first reflecting means, a substantial portion of the incident signal beam is reflected by said first reflecting means for subsequent transmission to the target, and (2) that when said returning signal beam is substantially centered on said first reflecting means and said returning reference beam is substantially centered on said second reflecting means, a substantial portion of said returning reference beam is reflected from the second reflecting means and combines with a substantial portion of said returning signal beam which is transmitted through said plate-like means, thereby forming a composite beam from which useful information concerning the target may be extracted, the remainders of said incident signal beam and said returning reference beam being so directed as to be substantially prevented from returning to the common source in the interferometer.

4,105,337

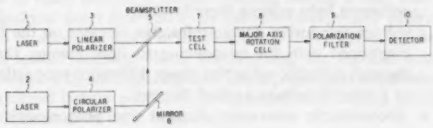
SELF-INDUCED ROTATION ELLIPSOMETER

Gary Carl Bjorklund, West Windsor, and Paul Foo-Hung Liao, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 11, 1977, Ser. No. 795,740

Int. Cl.² G02F 1/00

U.S. Cl. 356—114 **7 Claims**



1. A material detector comprising:

means for producing a first coherent optical beam at a first frequency, linearly polarized at a first angle,

means for producing a second, circularly polarized, coherent optical beam at a second frequency,

a test cell for holding a sample to be tested for the presence of said material,

means for transmitting collinearly said first and second beams through said test cell, whereby said first beam becomes elliptically polarized, having major and minor axes, when a quantity of said material is present in said test cell and the sum of said first and second frequencies is substantially equal to the frequency associated with a two-photon resonance of said material,

a major axis rotation cell containing a medium,

means for extracting said first beam from said test cell and for transmitting said first beam through said major axis rotation cell, whereby said major axis is rotated to a second angle by the interaction of said first beam with said medium, and

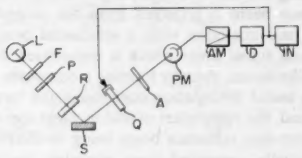
a polarization filter having an axis, intercepting said first beam after it has passed through said major axis rotation cell, which axis is oriented substantially at a right angle to said first angle, whereby said first beam is transmitted by said polarization filter only when said material is present in said test cell.

4,105,338

REFLECTION TYPE ELLIPSOMETER FOR MEASURING THIN FILM PHASE DIFFERENCE AND THICKNESS

Noboru Kuroha, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,689
Claims priority, application Japan, May 2, 1975, 50-52539
Int. Cl.[2] G01J 4/00
U.S. Cl. 356—118 7 Claims



1. A reflection type ellipsometer for measuring the phase difference of a sample, comprising:

a source of monochromatic light;

a polarizer for linearly polarizing light from said light source and passing the linearly polarized light for reflection by the incidence surface of a sample with the azimuth of the polarizer being disposed at an angle of 45° with respect to the incidence surface of the sample;

an analyser disposed on the path of reflected light from the sample and at an azimuth angle of 45° with respect to the incidence surface of the sample, said angles having opposite signs;

phase difference compensating means disposed on the light path between said polarizer and said analyser and at an azimuth angle of 0° with respect to said incidence surface for eliminating a predetermined phase difference from polarized light passing therethrough;

a voltage-responsive double-refractive element on the last-mentioned path for introducing to light passing therethrough a double-refraction phase difference proportional to a control voltage applied thereto;

a photoelectric converter element for photoelectrically converting the analyser output light to an output voltage; and

control means responsive to the output voltage from said photoelectric converter element for applying to said double-refractive element a control voltage which causes said double-refractive element to introduce to light passing therethrough a compensating phase difference corresponding to the amount of deviation of the phase difference of said sample from said predetermined phase difference.

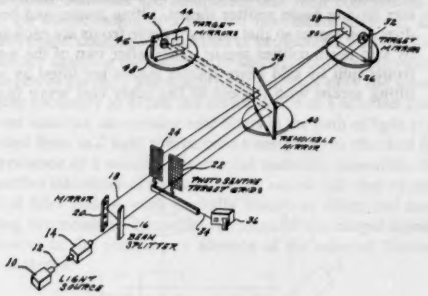
4,105,339

AZIMUTH MONITORING SYSTEM

Theodore E. Wirtanen, Chelmsford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 24, 1977, Ser. No. 762,079
Int. Cl.[2] G01B 11/26
U.S. Cl. 356—152 5 Claims

1. A system for monitoring changes in azimuth between widely separated points comprising: a source for a beam of coherent radiation; means for collimating said beam, beam splitting means for dividing said beam into a plurality of parallel beams; mirror means for reflecting each of said plurality of beams, including a plane mirror for measuring rotational movement and a prismatic reflector for measuring translatory movement; photosensitive target means for receiving each of



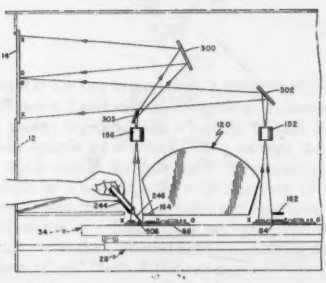
said beams, and recording means for receiving the output of said target means.

4,105,340

OPTICAL COMPARATOR AND INSPECTION APPARATUS

Paul S. Kempf, 703 Stratford Ct., Del Mar, Calif. 92104

Division of Ser. No. 568,866, Apr. 17, 1975, abandoned, which is a division of Ser. No. 190,187, Oct. 18, 1971, Pat. No. 3,888,593, which is a continuation-in-part of Ser. No. 63,180, Aug. 12, 1970, abandoned. This application Jul. 19, 1976, Ser. No. 706,676
Int. Cl.[2] G01B 9/08
U.S. Cl. 356—168 4 Claims



1. The method of making an optical comparison inspection of a master component and a sample component comprising the steps of:

illuminating corresponding portions of the master component and the sample component to be inspected,

moving both said master and said sample components relative to the illumination,

projecting light images of corresponding illuminated portions,

inverting one of said light images relative to the other of said light images,

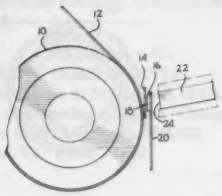
displaying said light images in edge-abutting relationship so that the images appear to converge or diverge from their common edge depending on the direction of movement of said components.

4,105,341

PRINT ELEMENT HAVING FLEXIBLE CHARACTERS

Donald R. Chivens, Northridge, and Edward C. Kelm, Pasadena, both of Calif., assignors to Lexitron Corporation, Chatsworth, Calif.

Filed Aug. 10, 1977, Ser. No. 823,440
Int. Cl.[2] B41J *1/32*
U.S. Cl. 400—144.2 9 Claims



1. An improvement in high speed printing devices comprising a type character and a hammer cooperative with a platen having a curved surface;

said type character having a normally flat printing surface and being sufficiently thin to permit resilient deformation;

said hammer having an impact surface configured such that as the printing surface of the type character comes into contact with the platen the impact surface of the hammer contacts the back side of said type character at two points, near the top and near the bottom, of the type character;

said hammer being operative to propel said flat type character against the curved surface of the platen; and

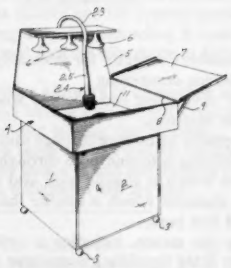
said curved platen and said hammer being cooperative to deform said flat type character only during printing so as to provide it with a curved printing surface which conforms to the curvature of the platen.

4,105,342

LIQUID DECANTING AND RECYCLING MACHINE

Aimé Plourde, 2é rang Centre, Trois-Pistoles, Canada

Filed Sep. 20, 1976, Ser. No. 725,042
Claims priority, application Canada, Sep. 26, 1975, 236509
Int. Cl.[2] A46B *15/00*; B08B *3/00*
U.S. Cl. 401—15 9 Claims



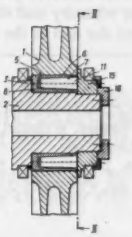
1. A liquid decanting and recycling machine comprising a reservoir for holding a liquid, a pan positioned above the reservoir, a drain operatively associated to the pan and having an outlet tube extending substantially vertically centrally into the reservoir and forming an outlet opening at its lower end adapted to be submerged in the liquid adjacent the bottom of said reservoir, a liquid circulation pump, an inlet for said pump submerged in the reservoir operatively close to the top surface of the liquid in the latter, at least two superposed spaced baffles positioned in the reservoir intermediate said outlet opening and said pump inlet and surrounding said outlet tube, said superposed baffles making liquid communication between portions of the reservoir immediately above and below the respective baffles, the communication of one baffle being at a different radial distance from said outlet tube than the communication of the other baffle, said baffles producing laterally wandering upward flow of the liquid from the outlet opening to the pump inlet, and an outlet conduit connected to the outlet of the pump and extending outwardly of the reservoir to supply a liquid flow above the pan.

4,105,343

RELEASABLE HUB-SHAFT-CONNECTION MECHANISM

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 24, 1977, Ser. No. 762,046
Claims priority, application Austria, Feb. 7, 1976, 730/76
Int. Cl.[2] F16D *1/06*
U.S. Cl. 403—15 11 Claims



1. In a releasable hub-shaft connection mechanism, in particular to be used in heavy machinery for transmitting strong torques, including: a shaft; a hub surrounding the shaft; at least one bore at the periphery of the shaft having an axis extending parallel to the axis of the shaft and penetrating the shaft and the hub to equal extents; a tubular bushing having a wall with a cylindrical outer face and a conical inner face, which bushing is to be accommodated in the at least one bore; and a tapering bolt axially displaceable in the bushing, the bushing being expandable by said tapering bolt, the improvement comprising:

a closed bottom provided on the end of said bushing having the smallest inner diameter;

a further bore extending through the bottom of the bushing to the outside; and

a pressure medium means for supplying a medium to said further bore under a pressure sufficient to displace the tapering bolt from a clamped position, in which the tapering bolt expands the bushing, into a release position.

4,105,344

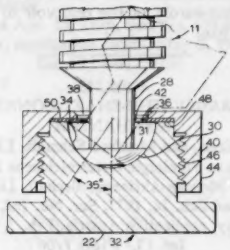
CONNECTOR FOR ATTACHING A SWIVEL PAD TO A SUPPORTING BOLT OF A CLAMP

Harold G. Rousom, Cambridge, Canada, assignor to James Morton Limited, Cambridge, Canada

Filed Mar. 10, 1976, Ser. No. 665,461
Claims priority, application Canada, Mar. 11, 1975, 221860
Int. Cl.[2] F16C *11/06*
U.S. Cl. 403—24 14 Claims

1. A connector for securing a swivel pad to a bolt shank of a clamp comprising a first connecting element formed at one end of said bolt shank and a second connecting element detachably secured to said swivel pad, said first connecting element comprising a head formed at the end of the bolt shank of enlarged cross-sectional area relative to the adjacent portion of the bolt shank having a substantially spherical end surface and truncated adjacent the bolt shank to define a spherical segment having a radial thickness of about $\frac{1}{8}$ to $\frac{1}{4}$ of the radius of the head spherical end surface and an annular shoulder substantially perpendicular to the axis of the shank, the swivel pad having a socket formed in one side thereof for receiving said

head, said socket having a radius substantially equal to the radius of the head spherical end surface, and said second connecting element comprising means detachably secured to said



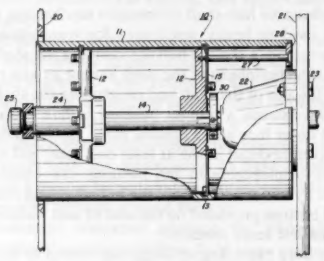
pad at the entrance to the socket to restrict the cross-sectional area of the entrance to the socket to prevent withdrawal of said head from said socket whereby said shoe assembly can freely pivot and swivel about the end of the shank.

4,105,345

EXPANDABLE PHOTORECEPTOR ENDBELLS

Edward Milton Van Wagner, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1976, Ser. No. 662,060
Int. Cl.[2] F16B 2/02
U.S. Cl. 403—24 **11 Claims**



1. In a drum support assembly including a shaft for supporting a drum thereon, the improvement comprising:
(a) a drum having outer and inner surfaces,
(b) web means adapted to be placed on said shaft, said web means comprising a plurality of individually adjustable circumferentially spaced lugs having serrated ends and located radially of said shaft, and
(c) holding means in the surface of said drum, spaced intermediate the ends thereof and operatively connected to said web means whereby said outer surface of said drum and said shaft are maintained relative to one another.

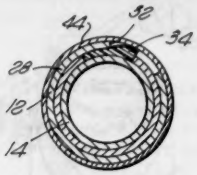
4,105,346

LOCKING SYSTEM FOR TELESCOPING MEMBERS

Ralph J. Gelinas, Northridge, Calif., assignor to Grayson, Gross, Friedman, Phillips and Rasch and Singer, Lewak, Greenbaum and Goldstein, both of Los Angeles, Calif., by Ralph J. Gelinas, a part interest to each

Filed Oct. 3, 1977, Ser. No. 838,928
Int. Cl.[2] F16B 7/14
U.S. Cl. 403—104 **4 Claims**

1. A locking sleeve for a pair of telescoping members comprising:
an outer telescoping leg of general cylindrical configuration and an inner telescoping leg, at least a portion of said inner leg being located within said outer leg, at least one of said legs being slidably movable with respect to the other leg along the leg axes, said outer telescoping leg having an aperture therein;
a sleeve positioned about the outer surface of said outer telescoping leg and rotatable about said outer leg, said sleeve having an aperture formed therein;
a brake lug positioned in said apertures and having a tapered



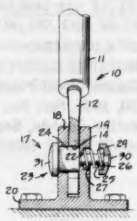
thickness about said leg axes, said brake lug tapering from a thickness approximately equal to the thickness of said outer telescoping leg to a thickness greater than said outer telescoping leg, and wherein rotation of said sleeve about said outer leg causes said lug to press against said outer surface of said inner leg and prevents said leg from being movable with respect to each other along the leg axes.

4,105,347

GIN POLE CONNECTOR

Thomas M. Gossage, 39 Seaview, Daly City, Calif. 94015

Filed Apr. 27, 1977, Ser. No. 791,501
Int. Cl.[2] F16C 11/06
U.S. Cl. 403—157 **8 Claims**



1. A releasable connector for releasably mounting a support member thereon comprising
a pair of upstanding and laterally spaced first and second support brackets,
means defining a first bore through said first support bracket,
means defining a second bore through said second support bracket which is aligned with said first bore and has an inside diameter which is smaller than the inside diameter of said first bore,
retaining pin means, including a cylindrical first portion closely fitted for sliding movement within said first bore and a cylindrical second portion closely fitted for sliding movement within said second bore and having an outside diameter less than the outside diameter of said first portion, reciprocally mounted in said first and second bores for movement between an attaching condition of operation disposing the first portion of said pin means between said support brackets and a releasing condition of operation disposing the second portion of said pin means between said support brackets, and
biasing means disposed between said pin means and said second support bracket for normally urging said pin means to its attaching condition of operation,
said pin means further comprising a head formed on a first end thereof, adjacent to the first portion of said pin, pro-

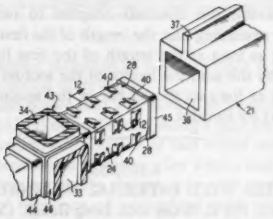
viding stop means for engaging an outer surface of said first bracket when said pin means is maintained in its attaching condition of operation, an annular face formed on an end of the first portion thereof providing stop means abutting an inner surface of said second bracket when said pin means is maintained in its attaching condition of operation and an annular washer mounted on the second portion of said pin means providing stop means for engaging an outer surface of said second bracket when said pin means is maintained in its releasing condition of operation.

4,105,348

BUILDING COMPONENTS

Edwin V. Anderson, and Joseph A. Mack, both of Glenview, Ill., assignors to AMCO Engineering Company, Chicago, Ill.

Filed Jun. 9, 1977, Ser. No. 805,022
Int. Cl.[2] F16B *12/20*
U.S. Cl. 403—172 **10 Claims**



1. Building components for constructing frames, enclosures and the like comprising,

hollow edge struts all of uniform cross-section, the ends of each said strut providing a female joint,

interlocking members having a central member with a plurality of legs extending outwardly therefrom and at fixed angles to each other,

said legs each defining a male member adapted to be inserted in said female joints and having locking clip recesses formed therein in at least two adjacent surfaces of predetermined ones of said legs,

said locking clip recesses spanning substantially the entire width of said surfaces of said legs and substantially the entire length thereof so as to form an abutment shoulder adjacent the ends thereof and the central member,

a locking clip having arms corresponding in number to and disposed within said locking clip recesses formed in said legs,

said arms each having a plurality of upstanding locking tabs formed therein and having a length and a width co-extensive with those of said locking clip recesses,

said edge struts each being cut to a specific length and interlocked together by means of said interlocking members to form said frames, enclosures and the like.

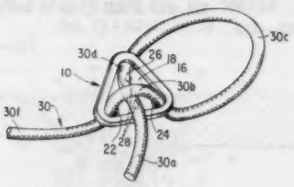
4,105,349

MECHANISM FOR FORMING A LOOP IN A ROPE OR THE LIKE

Sam Kupperman, Chicago, and Dennis I. Kupperman, Glenview, both of Ill., assignors to R B Toy Development Co., Skokie, Ill.

Filed Oct. 18, 1976, Ser. No. 733,332
Int. Cl.[2] F16G *11/00, 11/14*
U.S. Cl. 403—209 **4 Claims**

1. Means for securement to a flexible member, such as a rope or cord or the like, to form a loop in said flexible member with said flexible member having a free end, said means comprising an equilateral triangularly shaped locking plate having an opening therethrough adjacent each corner thereof, an upstanding border surrounding said plate and encircling said openings, a projection on said plate extending upwardly therefrom intermediate said openings, a portion of the flexible member extending over said plate between a pair of said openings and the free end of the flexible member extending through the



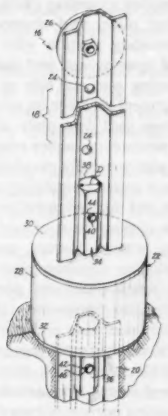
other opening underneath the said portion of the flexible member and in contact both with the upstanding border and the projection.

4,105,350

SAFETY FLEXURE FOR ARTICULATED CHANNEL-SHAPED ROADWAY POSTS

John Francis O'Donnell, P.O. Box 3314 Glenn Ave. Stations, Peoria, Ill. 61614

Filed Feb. 17, 1977, Ser. No. 769,731
Int. Cl.[2] E01F *9/01*
U.S. Cl. 403—220 **16 Claims**



1. A safety flexure for an articulated roadway post of the type having a cross-sectional configuration including a substantially U-shaped channel portion, comprising

a substantially cylindrical member of resilient material,

first and second metallic disc-like end caps securely bonded, respectively, to the opposite end faces of said cylindrical resilient member, and

first and second elongate rigid stud members fixedly attached, respectively, to said first and second end caps centrally thereof and perpendicular thereto, at least a portion of each of said elongate stud members being substantially complementary in size and shape with the channel portion of such articulated roadway post and being adapted to be securely but removably attached thereto,

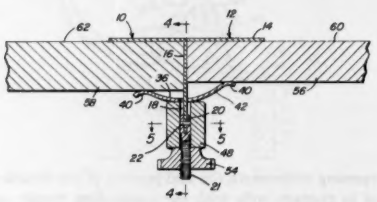
whereby upper and lower portions of such an articulated channel-shaped roadway post may be resiliently interconnected by attachment to respective ones of said first and second stud members.

4,105,351

LEVELING CLAMP

Robert C. Anderson, Baileys Harbor, Wis. 54202

Filed Apr. 4, 1977, Ser. No. 784,624
Int. Cl.[2] F16B 1/00
U.S. Cl. 403—312 **9 Claims**



1. A leveling clamp for clamping a pair of panel members together in edge-by-edge relation and with corresponding side faces of said panel members in substantially co-planar relation, said leveling clamp including a first plate, a second plate disposed generally normal and secured to said first plate centrally intermediate opposite marginal portions of said first plate with said second plate projecting outwardly from one side of said first plate and also disposed normal to a path extending between said opposite marginal portions, an elongated abutment member including opposite end portions and an intermediate portion extending between said opposite end portions, said end portions being offset to one side of said intermediate portion, said intermediate portion having a central opening formed therethrough, said second plate including an elongated endwise outwardly projecting mounting portion on its outer end remote from said first plate, said abutment member being mounted on said mounting portion with the latter loosely received through said opening and said one side of said intermediate portion opposing said one side of said first plate for movement of said abutment member on said mounting portion toward and away from said first plate and limited angular displacement of said abutment member relative to said mounting portion about an axis generally paralleling said plates, and adjustable displacement means operatively connected between said mounting portion and said abutment member intermediate portion for adjustable displacement of said abutment member along said mounting portion toward said first plate, said mounting portion including a narrow plate-like base end portion and a threaded shank outer end portion, said opening comprising a slot extending transversely of said intermediate portion through which said base end portion is slidably received, said adjustable displacement means including a thrust nut threaded on said threaded shank outer end portion, said adjustable displacement means also includes a sleeve slidably mounted on said mounting portion outwardly of said abutment member and inwardly of said thrust nut.

4,105,352

CORNER CLIP FOR A WINDOW PRODUCT

Joe W. Holdiman, Rantoul, Ill., assignor to Scovill Manufacturing Company, Waterbury, Conn.

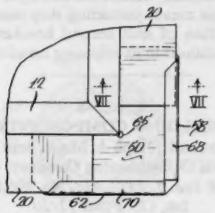
Filed Jul. 12, 1977, Ser. No. 815,067
Int. Cl.[2] F16B 2/20
U.S. Cl. 403—402 **8 Claims**

1. A corner clip connecting outwardly extending fins from a first and a second side of a window product comprising:

a base plate having a first leg integral with a second leg, the first leg defined by an inner and an outer side having a length the axis of which is generally parallel to the first side of the window product, the second leg defined by an inner and an outer side having a length the axis of which is parallel to the second side of the window product;

a first and a second lip extending upwardly along the inner sides of the first and the second legs from the base plate for engaging a slot formed between the fins and the first and the second side of the window product;

a first and a second channel extending along the outer side of the first and the second legs, the opening of the first and the second channel facing the first and the second lips,



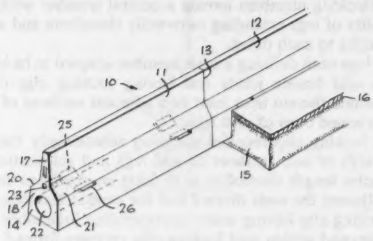
respectively, the channels adapted to receive the outwardly extending fins, the length of the first channel being at least as long as the length of the first lip which is engaged by the slot, the length of the second channel being at least as long as the length of the second lip which is engaged by the slot.

4,105,353

BARRIER WITH INTERNAL DRAINAGE DUCT

C. Gary Bórk, 185 E. Bixby Rd., Long Beach, Calif. 90807, and John E. Kenan, 747 Luton Dr., Glendale, Calif. 91206

Continuation of Ser. No. 622,079, Oct. 14, 1975, abandoned.
This application Dec. 6, 1976, Ser. No. 747,817
Int. Cl.[2] C01C 11/22
U.S. Cl. 404—2 **7 Claims**



1. A barrier comprising:

a barrier having a thickened foot portion buried in ground supporting pavement for a roadway, an upstanding portion projecting above the surface of said pavement, and a tapered intermediate portion integrally interconnecting said foot portion to said upstanding portion;

said foot portion provided with an open-ended duct below said pavement and at least one passageway connecting the surface of said pavement to said duct whereby said duct is in communication exteriorly of said foot portion; and

a second open-ended duct provided in said intermediate portion in fixed parallel relationship with respect to said first mentioned duct.

4,105,354

PATTERN FORMING WHEEL FOR UNCURED CONCRETE SURFACES

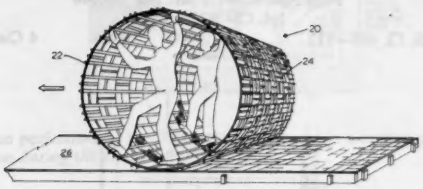
Bradshaw Bowman, P.O. Box 131, Escalante, Utah 84726

Filed Apr. 27, 1977, Ser. No. 791,574
Int. Cl.[2] E01C 23/02
U.S. Cl. 404—72 **18 Claims**

18. In a method of patterning the exposed surface of an

uncured concrete slab to the appearance of laid bricks, tiles, cobblestones and the like, including the steps of forming the concrete slab on the ground, floating the exposed surface of said slab to bring up the finest particles of the concrete material, and driving forming blades in a predetermined pattern conforming to the shapes of said bricks, tiles, cobblestones and the like into said exposed surface to a predetermined effective depth, the improvement comprising the steps of:

(a) providing said blades continuously along the outer area of a large, axleless generally cylindrical wheel having an



inside diameter sufficient to accommodate a worker in a walking position therewithin;

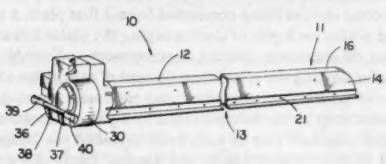
(b) driving said blades into said surface to a desired depth by rotating said cylindrical wheel along a path on said surface to be patterned, said rotation of said wheel resulting from walking movements of said worker within said wheel, said blades being arcuately driven into said surface at the location of tangency of said wheel with said slab, and automatically being withdrawn from said slab after penetration by continued rotation of said wheel.

4,105,355

DEVICE FOR TAMPING AND LEVELING CONCRETE AND THE LIKE

Junior Keith King, R.R. 1, Box 106A, and Lowell W. Warden, 304 3rd St., both of Russiaville, Ind. 46979

Filed Oct. 20, 1976, Ser. No. 734,303
Int. Cl.² E01C *19/38*
U.S. Cl. 404—114 **5 Claims**



1. A device for tamping and leveling concrete and the like which comprises:

an elongated member having a substantially flat bottom surface, said member defining a downwardly-open aperture adjacent an end of said member;

a housing mounted to said member above said member;

a shaft extending parallel to the bottom surface of said member, said shaft being rotatably mounted within said housing;

several weights eccentrically mounted upon said shaft at spaced apart locations within said housing;

drive means for rotating said shaft and said weights mounted thereupon, said drive means including a motor connected to and operable to rotate said shaft, the motor being mounted to and supported by said member and positioned adjacent an end of said member; and

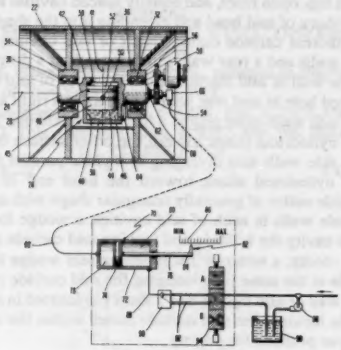
handle means for permitting control of the movement of said member along a surface, said handle means including a stake received within and extending downwardly through the aperture defined by said member.

4,105,356

VIBRATORY ROLLER

Houston Lee Loveless, Springfield, Ohio, assignor to Koehring Corporation, Milwaukee, Wis.

Filed May 19, 1977, Ser. No. 798,310
Int. Cl.² E01C *19/38*
U.S. Cl. 404—117 **7 Claims**



1. In vibratory compacting roller apparatus of the type having a compacting roll rotatable about a generally horizontal axis, shaft means rotatable about said axis at a speed independent of that of said roll, and an eccentric mass rotatable with said shaft means to develop forces for vibrating said roll, said eccentric mass being movable transversely of said shaft means to different positions relative to said axis to provide variable amplitude for vibrations induced thereby, the improvement comprising:

cylinder means rotatable with said shaft means and having a chamber therein for receiving said eccentric mass, said chamber being shaped to permit movement of said eccentric mass radially of said axis from an innermost limit to an outermost limit;

means for conducting fluid to or from an end portion of said chamber to increase or decrease the eccentricity of said eccentric mass during rotation of said shaft means;

motor means connected to said means for conducting fluid such that a constant volume of fluid is located between said eccentric mass and said motor means and so that a change in position of said motor means will be accompanied by a change in radial position of said eccentric mass; and

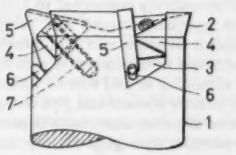
indicator means connected with the motor means and operable to provide a representation of the position of the eccentric mass between the maximum and minimum eccentricity positions thereof.

4,105,357

CARBIDE INSERT CUTTING TOOL

John Kehl, 2714 Westminster Blvd., Windsor, Ontario, Canada

Filed Apr. 28, 1976, Ser. No. 681,179
Int. Cl.² B26D *1/12*
U.S. Cl. 407—41 **2 Claims**



1. A cutting tool for light final stage cutting and precision

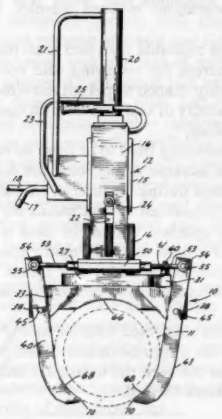
finishing only of metals and other materials in profiling machine operations, capable of continuous uninterrupted cutting in all directions and planes, because it is capable of cutting in an upward or downward direction without requiring the removal of the cutter from the work to change the direction of the cutting; comprising a solid metalic cylindrical shank which terminates at its top with a narrow flared head; a plurality of open top, open front, and equally spaced cavities located at the periphery of said head and extending into the shank, for inserting therein carbide cutters, each of said cavities having two side walls and a rear wall which extends at a downward angle to the wall of said shank to form the floor of said cavity, and a tapped hole in said rear wall extending at a right angle thereto, said side walls diverging in a plane perpendicular to the axis of said cylindrical shank toward the outer surface of said shank, said side walls also diverging in a plane parallel to the axis of said cylindrical shank toward the head end of said tool; a carbide cutter of generally triangular shape with spaced, parallel side walls in each of said cavities; a wedge located within each cavity for holding and locking said carbide cutter within said cavity; a setscrew for fastening said wedge to the cavity, while at the same time wedging the said carbide cutter against one wall of said cavity; and a short pin located in said cavity to aid in locating the said carbide cutter within the cavity, in the proper position for cutting.

4,105,358

SUPPORT DEVICE FOR PIPE DRILLER

Richard J. Walker, 16805 - 93rd St., Bristol, Wis. 53104

Filed Sep. 27, 1976, Ser. No. 726,816
Int. Cl.[2] B23B *45/14*
U.S. Cl. 408—108 **6 Claims**



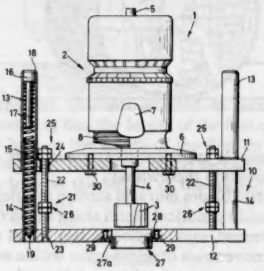
1. A support device for receiving and positioning a drilling device on a pipe surface, said drilling device having a support base presenting opposing lateral sides and a self-contained raising and lowering mechanism for the drill of said drilling device, said support device comprising a frame member defining two pairs of arm members extending from said frame member in a first and a second direction and pivotally secured thereto, means operatively connected to said arm members to move said arm members toward and away from said pipe surface, said means to move said arm members positioned in conjunction with said arm members in said first direction, said arm members extending in said second direction having arcuate portions to directly contact said pipe along a multiplicity of points, said frame member comprising opposing side members with concave portions to engage the top section of said pipe surface and clamp means defined by said opposing sides of said drilling device support base and said opposing side members of said frame member, so that said drilling device is readily received in said frame member and retained therein independently of said raising and lowering mechanism.

4,105,359

ADAPTOR FOR COUNTERSINKING DEVICE

Eberhard Schneider, Cologne, and Theodor Vitt, Porz-Eil, both of Fed. Rep. of Germany, assignors to Prameta Prazisonsmetallund Kunststofferzeugnisse G. Baumann & Co., Fed. Rep. of Germany

Filed Apr. 6, 1977, Ser. No. 785,040
Int. Cl.[2] B23B *39/00*
U.S. Cl. 408—112 **4 Claims**



1. An adapter for a countersinking device comprising first and second plates disposed in generally parallel relationship to each other and being relatively movable in a direction generally normal to said plates, said first plate carrying a countersinking tool, said second plate being disposed below said first plate and having aperture means in alignment with said countersinking tool, means normally urging said plates toward a relative position of maximum spacing therebetween, said urging means including two pair of sleeves with a first end portion of a first sleeve of each pair of sleeves being in telescopic relationship with a first end portion of a second sleeve of each pair of sleeves, a second end portion of each first sleeve being connected to said second plate, said first end portions of said second sleeves being connected to said first plate, a spring housed within each pair of sleeves urging the plates toward the position of maximum spacing therebetween, adjustable stop means for limiting the relative movement of said plates toward both said positions of minimum and maximum spacing, said adjustable stop means being defined by a pair of threaded pins each carrying two pair of nuts, each threaded pin being connected to one of said plates and passing freely through an opening of another of said plates, a first pair of said nuts being disposed between said plates and a second pair of said nuts being disposed above said first plate, said aperture means having an axis, and an imaginary line passing through said pins being offset from the axis of said aperture means.

4,105,360

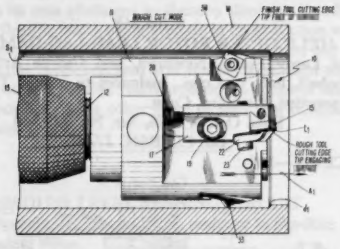
DUAL CUT BORING TOOL ASSEMBLY

Dale L. Keller, Gettysburg, Pa., assignor to R. H. Sheppard Co., Inc., Hanover, Pa.

Filed Jun. 8, 1977, Ser. No. 804,801
Int. Cl.[2] B23B *39/16*; B23G *1/20*
U.S. Cl. 408—118 **20 Claims**

1. A tool assembly for performing rough and finish cutting operations on a workpiece having a curved surface by relative movement therewith comprising a tool support bar, first cutter means mounted on said tool bar for performing a rough cut along the curved surface, second cutter means mounted on said tool bar for performing a finish cutting operation along said curved surface, and means movably mounting said second

cutter means for positioning said second cutter means alternately in a noncutting position during the rough cutting operation performed by the first cutter means and in a cutting position during the finish cutting operation.

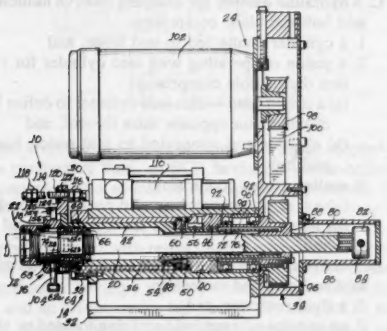


4,105,361

MACHINE TOOL HAVING QUILL CONTROL MEANS

Robert J. Petroff, 1703 S. Main St., Lombard, Ill. 60148

Filed Dec. 6, 1976, Ser. No. 747,531
Int. Cl.² B23B 47/22
U.S. Cl. 408—130 **9 Claims**



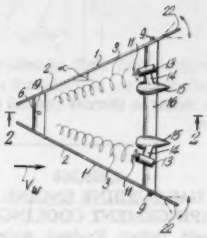
1. In a machine tool adapted for controlled axial movement of a tool from a retracted position toward a workpiece, said machine tool including a housing, a quill supported by said housing and axially movable relative to said housing, a spindle rotatably carried by said quill and axially fixed thereto for movement therewith, said spindle having means at its outer end to support a tool, said quill and spindle defining forward ends thereon movable outwardly from said housing upon selective axial movement of said quill and spindle, means for rotating the spindle, and means operatively associated with said quill to effect axial movement of said quill and spindle toward said workpiece, the combination therewith comprising control means supported by said housing and operatively associated with said quill to control the speed of axial movement thereof toward said workpiece, said control means including control link means disposed eccentric to the axis of said quill, first means interconnecting said control link means to said quill adjacent its said outer end to facilitate control of the longitudinal speed thereof toward said workpiece, and second means interconnecting said first means to said housing so as to prevent exertion of a bending moment on said quill be said control link means in a direction tending to cause deviation of said spindle from its intended axial direction during longitudinal movement thereof, said first means interconnecting said control link means to said quill including a yoke member connected to said control link means, said second means having a pair of guide bars fixedly secured to said yoke member, said guide bars being longitudinally slidable within corresponding guide slots in said housing, and said yoke being connected to said quill through a sliding connection such that a resistive force applied to said yoke by said control means acts substantially axially of said quill, with bending moments created on said yoke acting on said housing through said guide bars.

4,105,362

DOUBLE VORTEX AUGMENTOR WIND CONVERSION SYSTEM

Pasquale M. Sforza, Huntington, N.Y., assignor to Polytechnic Institute of New York, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 564,681, Apr. 3, 1975, Pat. No. 4,047,832. This application Jun. 6, 1977, Ser. No. 803,438
Int. Cl.² F03D 1/04
U.S. Cl. 415—2 **8 Claims**



1. A fluid flow energy conversion system for converting diffuse flow power into useful output power, the system comprising turbine means, and a pair of edge separation vortex generators symmetrically deployed in a generally V shaped angulated configuration for driving said turbine means, said configuration including means for orienting the configuration such that the apex region thereof points upstream and the axis of symmetry substantially aligns with the direction of fluid flow and wherein the configuration is dimensioned such that each vortex generator is deployed at a desired angle of attack with respect to said fluid flow.

4,105,363

OVERSPEED CONTROL ARRANGEMENT FOR VERTICAL AXIS WIND TURBINES

John Lodewyk Loth, P.O. Box 4094, Morgantown, W. Va. 26505

Filed Jun. 14, 1976, Ser. No. 696,116
Int. Cl.² F03D 3/06, 7/06
U.S. Cl. 416—41 **14 Claims**

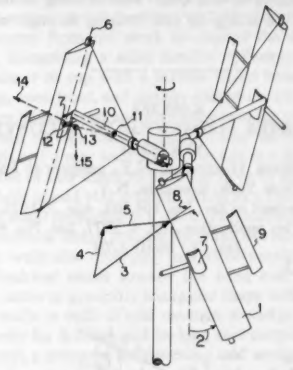
1. In a vertical axis wind turbine having a shaft mounted along the vertical axis of said wind tubine, a rotor mounted on said shaft for rotating said shaft about the vertical axis of said wind turbine comprising:

support arm means;

mounting means for mounting said support arm means on said shaft of said wind turbine along a generally radial axis extending therefrom, said mounting means enabling said support arm means to rotate about its radial axis a predetermined amount; and

rotor blade means formed by an air foil mounted on said support arm means in a position normal to said support arm means for rotation about the vertical axis of said wind turbine in response to the interaction between the wind and said rotor blade means, said rotor blade means being generally parallel to the vertical axis of said wind turbine during normal operating speeds but, upon reaching a predetermined operating speed exceeding the normal operating speed, tilting about the radial axis of said sup-

port arm means in a swept wing configuration in response to a small component of centrifugal force acting on said



rotor blade means to thereby control the operating speed of said rotor.

4,105,364

VANE FOR A GAS TURBINE ENGINE HAVING MEANS FOR IMPINGEMENT COOLING THEREOF

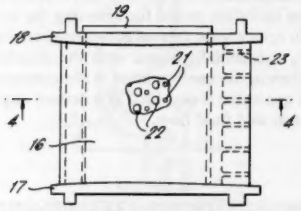
Alec George Dodd, Belper, England, assignor to Rolls-Royce Limited, London, England

Filed Dec. 7, 1976, Ser. No. 748,289

Claims priority, application United Kingdom, Dec. 20, 1975, 52293/75

Int. Cl.² F01D *5/18*

U.S. Cl. 416—97 R **4 Claims**



1. A vane for directing hot gases in a gas turbine engine comprising: at least one platform; a hollow aerofoil portion extending from said platform and having an exterior surface for contacting and directing the hot gases and an interior surface; means for impingement cooling of the interior surface of the hollow aerofoil portion of said vane, said impringement cooling means including a cooling fluid entry tube extending within and generally spanwise of said aerofoil portion of the vane and spaced from the interior surface thereof, said cooling fluid entry tube having a plurality of apertures therein for directing jets of impingement cooling fluid onto the interior surface of the aerofoil portion; at least one exhaust slot on the trailing edge of said aerofoil portion, said at least one slot setting up a general flow path of cooling fluid in the space between the internal surface of said aerofoil portion and the cooling fluid entry tubes exterior and then exhausting the same to the exterior of the aerofoil portion; and a plurality of columnar projections extending between the interior surface of the aerofoil portion and the cooling fluid entry tubes exterior, each projection being positioned directly upstream of one of said apertures with respect to said general flow path of cooling fluid in the space between the internal surface of said aerofoil portion and the cooling fluid entry tubes exterior so that the jet of cooling fluid entering the space lies in a zone of separation of flow behind the projection whereby the jet of cooling fluid entering through the aperture is undisturbed by the general flow path of the cooling fluid in the space between the interior surface of the aerofoil portion and the cooling fluids exterior.

4,105,365

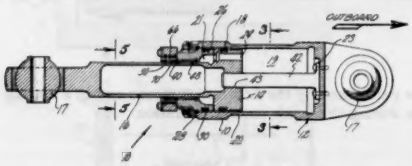
HELICOPTER ROTOR LEAD-LAG DAMPER

Donald Leroy Ferris, Newtown, and George Arthur Smith, Trumbull, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 4, 1976, Ser. No. 729,340

Int. Cl.² B64C *27/42*

U.S. Cl. 416—107 **7 Claims**



1. A helicopter rotor having:

A. a rotatable hub,

B. at least one blade supported by said hub for rotation therewith,

C. a hydraulic damper for damping relative motion between said hub and blade comprising:

1. a cylinder connected to said blade, and

2. a piston cooperating with said cylinder for reciprocation therewithin comprising:

(a) a piston head within said cylinder to define hydraulic chambers on opposite sides thereof, and

(b) a piston rod connected to said piston head and to said hub,

3. sealing means comprising:

(a) a seal ring enveloping said piston rod, and

(b) means to support said seal ring from said cylinder, and

D. fluid reservoir means enveloping said piston rod adjacent said seal ring and including:

1. a fluid reservoir, and

2. an annulus adjacent said seal ring located on the remote side of said seal ring from said piston head, and

3. means connecting said reservoir to said annulus to direct fluid from said reservoir to said seal ring in response to centrifugal force.

4,105,366

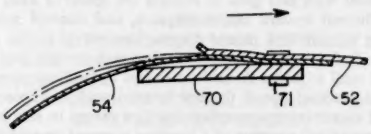
TWISTED FLEX FAN

Michael Thomas Spellman, Indianapolis, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Division of Ser. No. 576,728, May 12, 1975, Pat. No. 4,012,168. This application Sep. 14, 1976, Ser. No. 723,108

Int. Cl.² F04D *29/38*

U.S. Cl. 416—132 A **4 Claims**



1. A fan blade construction adapted for use in an internal combustion engine, a flexible fan blade having a stiffened leading edge, the blade adapted to be coupled to a rotatable hub by means of mounting arms, a rigid mounting arm, the flexible blade rigidly secured to the mounting arm, said flexible blade having an abutment portion which resiliently bears

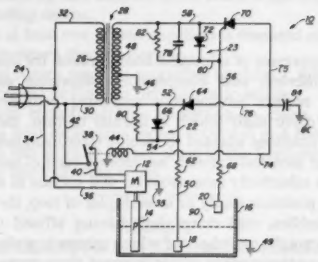
against an abutment portion of said arm at a region spaced from the rigid securement of the blade to the arms, whereby upon rotation of the flexible blade air reaction forces and centrifugal forces above a predetermined amount flex the flexible blade away from its arm abutment to thereby diminish its effective pitch, said flexible blade being arcuate in cross-section with its concave side facing one side of said mounting arm, and defining a space therebetween, said arm and blade secured together in overlapped and parallel relation along one edge of said arm, at least a portion of the other edge of said arm defining said arm abutment portion.

4,105,367

LIQUID LEVEL SENSING CIRCUIT

Ralph M. Francis, Jr., Racine, Wis., assignor to Sta-Rite Industries, Racine, Wis.

Filed Oct. 18, 1976, Ser. No. 733,520
Int. Cl.² F04B *49/06*; H01H *35/18*
U.S. Cl. 417—36 **3 Claims**



1. A fluid level sensing circuit comprising a probe adapted to contact a conductive fluid, an SCR having its anode-cathode circuit connected to a source of AC operating potential, the gate of said SCR being coupled to said probe, a diode coupled between said probe and the cathode of said SCR, said diode being oppositely poled with respect to the gate-cathode circuit of the SCR to permit AC conduction at the probe-fluid contact and a transformer having a primary winding and a secondary winding, and an off-set center tap electrically coupled to said secondary winding, further comprising a second probe, a second SCR having its anode-cathode circuit connected to said source, the gate of said second SCR being coupled to said second probe, and a second diode coupled between said second probe and the cathode of said second SCR, said second diode being oppositely poled with respect to said gate-cathode circuit of said second SCR to permit AC conduction at the contact of said second probe and said fluid further including a pump electrically coupled to said circuit for changing the level of said fluid, a relay for energizing said pump, first resistive means electrically coupled between said relay and said first mentioned SCR, and second resistive means electrically coupled between said relay and said second SCR.

4,105,368

FLOATING WAVE POWERED PUMP

Fred L. Waters, c/o Transworld Drilling Company, Ltd. P.O. Box 25861, Oklahoma City, Okla. 73125

Filed Nov. 15, 1976, Ser. No. 742,075
Int. Cl.² F04B *17/00, 35/00*; F16H *25/12, 25/14*
U.S. Cl. 417—53 **14 Claims**

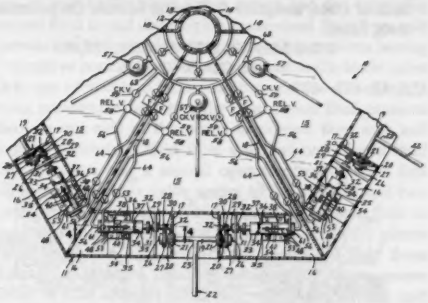
14. A method of harnessing energy generated by the wave motion of a body of water comprising the steps of:

(a) supporting a primary float having a plurality of secondary floats attached by lever arms to rotatable shafts carried by the primary float upon a body of water;

(b) oscillating said secondary floats relative to said primary float thereby imparting oscillatory rotary motion to the shafts;

(c) converting the oscillatory rotary motion of the shafts to linear motion of pistons of pumps;

(d) pumping hydraulic fluid with the pumps; and



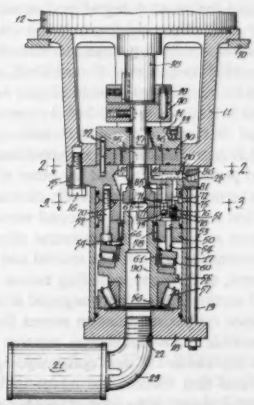
(e) storing the hydraulic fluid thus pumped into pressure storing devices for selective use thereafter.

4,105,369

TWO-STAGE PUMP

Samuel B. McClocklin, Owatonna, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.

Filed Jun. 30, 1977, Ser. No. 811,560
Int. Cl.² F04B *23/12*
U.S. Cl. 417—206 **10 Claims**

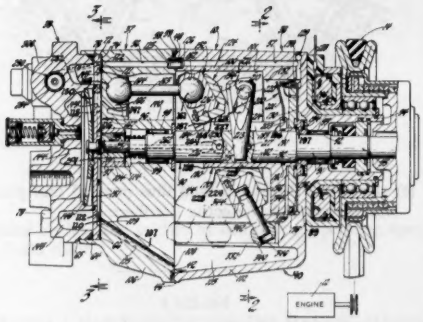


1. A two-stage pump having low and high pressure stages including a casing, a pair of pumps in said casing each having a rotatable pump element in coaxial relation, drive shaft means for rotating both of said pump elements, an outlet port from said casing, each of said pumps having a fluid inlet and a fluid outlet with the fluid outlet of one pump being in flow relation with said outlet port and the fluid inlet of the other pump, and means for supplying fluid to the fluid inlet of said one pump including a flow passage through the rotatable pump element of said other pump.

4,105,370
VARIABLE DISPLACEMENT COMPRESSOR WITH THREE-PIECE HOUSING

Byron L. Brucken, Miamisburg, and Roy E. Watt, Brookville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 19, 1977, Ser. No. 798,583
Int. Cl.[2] F04B 1/26
U.S. Cl. 417—222 3 Claims

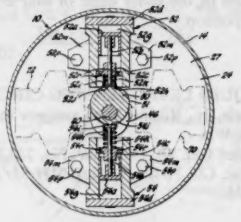


1. A variable output axial compressor of the wobble plate type including a cast three part compressor housing having a first shell-like front section defining by integral portions thereof a wobble plate mechanism cavity and an expansible chamber, a second intermediate cylinder block section and a third rear cylinder head section connected in series to form said housing, a crankcase in said housing, a drive shaft having its one end journaled in an integral end cover of said first section and the shaft other end journaled in said second section, said second section having a cylinder bore formed therein substantially parallel to the axis of said shaft, a compressor piston arranged to reciprocate in said cylinder bore, a wobble plate mechanism in said cavity operated in response to rotation of said shaft and drivingly connected to said compressor piston, one of said first and second sections terminating in a rearwardly directed peripheral edge and the other of said first and second sections terminating in a forwardly directed planar face such that said first section edge and second section face are in flush engagement at a common transverse plane, means for removably interconnecting said first, second and third sections in axial alignment, said means including means whereby said first and second sections are sealably engaged at said transverse plane, compressor output modulation means for varying the angle of the wobble plate mechanism relative to said drive shaft and thus the stroke of said compressor piston in said cylinder bore, said first section end cover including a blind bore in the center thereof open to said wobble plate cavity, a modulation piston slidably received in said end cover blind bore thereby forming an expansible chamber, oil pump means in said housing, passage means for conducting oil from said housing crankcase to the inlet of said pump means and from the outlet of said pump means to said expansible chamber for effecting movement of said modulation piston, and control means regulating the flow of oil from said crankcase to said expansible chamber for causing the travel of said modulation piston to regulate said wobble plate mechanism and thus the pumping capacity of said compressor.

4,105,371
CAM DRIVEN COMPRESSOR

Jack W. Savage, Centerville, Ohio, and Thomas J. Savage, La Grange, Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 15, 1976, Ser. No. 732,927
Int. Cl.[2] F04B 19/00, 1/14
U.S. Cl. 417—238 4 Claims

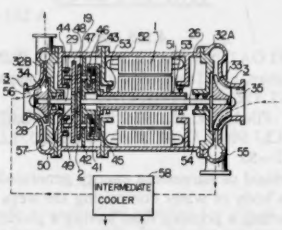


1. A compressor of selectable configuration for changing the capacity thereof, said compressor comprising an exposed mounting surface having four mounting positions thereon around a drive shaft which is normal thereto, each of said mounting positions adapted to receive interchangeably thereat one of four identical cylinder assemblies, each of said cylinder assemblies selectively mountable on said surface in any of said mounting positions singly or in multiples of two, three or four such assemblies, said drive shaft having affixed thereto an eccentric cam the periphery of which rotates in a plane parallel to said mounting surface and is exposed thereon, each of said cylinder assemblies comprising a cylinder bore selectively opened and closed at an outboard end thereof by intake and exhaust valve means and closed at an inboard end thereof by a guide member, a piston reciprocable in said cylinder bore and having a piston rod affixed at one end to said piston and slidably received in said guide member, said piston rod having an exposed cam follower affixed to the other end thereof sandwiching a spring between said cam follower and said guide member to bias said piston toward said inboard end of the cylinder bore and said cam follower against the exposed periphery of said cam when said cylinder assembly is in any of said four mounting positions.

4,105,372
FLUID ROTARY MACHINE

Haruo Mishina, Inashiki; Kazuhiro Sunobe, Urawa, and Kunio Fujie, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 20, 1976, Ser. No. 650,765
Claims priority, application Japan, Jan. 31, 1975, 50-12571
Int. Cl.[2] F01D 1/24, 13/00
U.S. Cl. 417—243 21 Claims



1. A fluid rotary machine comprising:
a rotor electrical device including a main shaft rotatable about a main axis,

fluid means including a plurality of impellers and casing means enclosing said impellers and defining passages for fluid to be sucked into and discharged from said impellers, said impellers having respective impeller rotational axes aligned with said main axis,

and transmission means for operatively drivingly connecting said main shaft with said impellers, said transmission means including a plurality of output shafts which rigidly support respective ones of said impellers for rotation therewith and a gear train for gearingly connecting the main shaft with said output shafts to rotate said output shafts at respective predetermined rotational speeds as compared to the rotational speed of said main shaft, said output shafts having rotational axes aligned with said main axis,

said gear train including an output shaft gear mounted rigidly on each of said output shafts at an end thereof for rotation therewith and at least three support gears meshed with and supporting said respective output shaft gears to thereby rotatably support said end of said respective output shafts by said support gears without the interposition of bearing means,

wherein at least one of said impellers is disposed at each side of said rotary electric device.

2. A fluid rotary machine according to claim 1, wherein said rotary electrical device is a drive electric motor.

8. A fluid rotary machine according to claim 2, further comprising heat exchanger means provided in a fluid passage connecting the impeller of one stage of the fluid means to the impeller of the following stage.

4,105,373

FLUID DISTRIBUTOR DEVICE FOR CONTROLLING AN APPARATUS FOR PUMPING WET CONCRETE AND THE LIKE

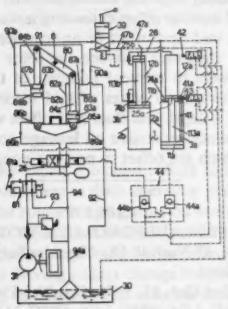
Sergio Calzolari, Rome, Italy, assignor to Fogt Industriemaschinenvertretung A.G., Chur, Switzerland

Continuation-in-part of Ser. No. 523,017, Nov. 12, 1974, Pat. No. 3,994,627. This application Nov. 23, 1976, Ser. No. 744,326

Claims priority, application Italy, Nov. 24, 1975, 52362 A/75

Int. Cl.[2] F04B *9/10, 35/02, 15/02*

U.S. Cl. 417—317 **1 Claim**



1. In an apparatus for pumping wet concrete and the like comprising a pair of piston pumps mounted in parallel relation and operating in phase opposition, said piston pumps each having a reciprocating pump piston and a pump cylinder, each pump cylinder having an open end, a baffle blade valve means arranged at the open ends of said pump cylinders and having two limit positions for controlling the charging and discharging of wet concrete through respective open ends of said pump cylinders, a double-acting fluid pressure piston and cylinder arranged coaxially with each piston pump for driving said piston pumps, a common piston rod for mounting the pistons of the associated piston pump and double-acting fluid pressure piston and cylinder, a source of pressurized fluid, a fluid actuator-distributor means coupled to said baffle blade valve means and hydraulically connected between said source of pressurized fluid and said fluid pressure cylinders for controlling the position of said baffle blade valve means and for supplying pressurized fluid to and discharging pressurized fluid from said fluid pressure cylinders, said actuator-distributor means having a first operative position for first moving said baffle blade valve means to one of said two limit positions and for subsequently supplying pressurized fluid to a first one of said fluid pressure cylinders on one side of the piston associated therewith and discharging pressurized fluid from a second one of said fluid pressure cylinders and a second operative position for first moving said baffle blade valve means to the other of said two limit positions and subsequently supplying pressurized fluid to said second fluid pressure cylinder on one side of the piston associated therewith and discharging pressurized fluid from said first fluid pressure cylinder, changeover valve means connected to said actuator-distributor means for shifting said actuator-distributor means between the first and second operative positions thereof, and conduit means connected between said first and second fluid pressure cylinders on the other sides of the pistons associated therewith for hydraulically interlocking the movements of the pistons of said fluid pressure cylinders, the improvement comprising said actuator-distributor means comprising two fluid pressure pistons and cylinders operating in phase opposition, said baffle blade valve means having a spindle about which said baffle blade valve means pivots between said two limit positions, a rocking bar having ends and fixedly connected to said spindle intermediate the ends of said bar, the pistons of the actuator-distributor means each having a piston rod connected to a respective end of said rocking bar, each fluid pressure cylinder of said actuator-distributor means having closed ends and communicating with three orifices comprising a first orifice positioned adjacent one of said closed ends, the first orifices being connected by a pipe, a second orifice positioned adjacent the other of said closed ends, the second orifices being connected to one side of said changeover valve means, the other side of said changeover valve means being connected to said pressurized fluid source and a fluid reservoir and a third orifice positioned intermediate said first and second orifice such that fluid communication is established between the second and third orifice when the associated piston of the actuator-distributor means is positioned adjacent the first orifice, a respective third orifice being connected to a respective one of said first and second fluid pressure cylinders of said piston pumps for the supply and discharge of pressurized fluid thereto, said pipe connecting said first orifices being connected with said fluid reservoir.

4,105,374

INTEGRATED MULTI-UNIT REFRIGERATION MOTOR-COMPRESSOR ASSEMBLY

Philip H. Scharf, Dayton, Ohio, assignor to Copeland Corporation, Sidney, Ohio

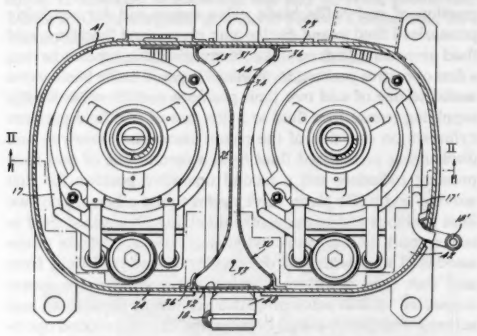
Filed Mar. 28, 1977, Ser. No. 781,792

Int. Cl.[2] F04B *17/04;* **F25B** *31/02*

U.S. Cl. 417—415 **16 Claims**

1. A hermetic multi-unit refrigeration motor-compressor assembly comprising in combination with a sealed metallic housing having top, bottom and side walls, a pair of motor-compressor units in spaced parallel relation in the housing, characterized by a partitioning member extending transversely within the housing between said units to define two compartments, each of which contains one of said units, the partition-

ing member being affixed to the side walls and top wall but substantially spaced above the bottom wall of the housing,



whereby the bottom portion of the housing defines a common oil sump area.

4,105,375

ROTARY PISTON COMPRESSOR

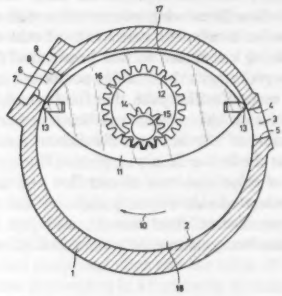
Gerhard Schindelhauer, Berlin, Fed. Rep. of Germany, assignor to Borsig GmbH, Berlin and Wankel GmbH, Lindau, both of Fed. Rep. of Germany

Filed Jan. 16, 1975, Ser. No. 541,438

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1974, 2402084

Int. Cl.[2] F04C *29/08*

U.S. Cl. 418—54 **4 Claims**



1. In combination with a fast running rotary piston compressor with a housing which consists of a stationary mantle defining a running path with a surface having multiple bore trochoid form and side portions therewith including an eccentric shaft passing at right angles therethrough and having an eccentric portion with a multiple corner piston rotatably journalled thereby including a piston flank forming a compression chamber so that the piston moves with corners thereof along the inside of the mantle and so that piston movement is controlled by a drive consisting of a hollow wheel fixed on the piston and a pinion fixed on one of the side portions whereby opening and closing of inlet and outlet openings of the housing become controlled by the contours of the piston, the improvement therewith comprises when the piston has a location in the dead point position to a position resulting due to further turning of the eccentric shaft up to a few degrees, the start of an inlet passage inside the mantle being arranged directly ahead of the location where a leading corner of the piston in the direction of piston rotation engages the mantle.

4,105,376

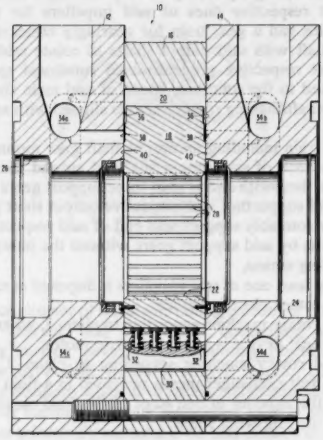
ROTOR FOR HYDRAULIC PUMP OR MOTOR

Allan E. Heinrich, Oconomowoc, Wis., assignor to Applied Power, Inc., Milwaukee, Wis.

Filed Feb. 3, 1977, Ser. No. 765,311

Int. Cl.[2] F01C *21/00*; F03C *3/00*

U.S. Cl. 418—77 **5 Claims**



1. In a fluid pressure motor comprising a rotor having sidewalls and peripheral edge portions, a stator ring surrounding said rotor and defining a plurality of working chambers therewith, slidable vanes received in radial slots in said rotor and normally biased into abutment with said stator ring, a housing for said rotor defining a rotor chamber having sidewall surfaces facing the sidewalls of said rotor, a central axially extending bore in said housing and said rotor and adapted to receive a shaft, for drivingly engaging said rotor with said shaft, fluid inlet and outlet means for communicating with said chambers, the improvement wherein said rotor has two stepped annular offsets in each sidewall of said rotor, the first annular offset extending inwardly from the circumferential edge of said rotor and the second annular offset extending inwardly from the first annular offset, said first offset being just deep enough to provide sufficient clearance between the rotor sidewalls and the chamber sidewalls to prevent gouging of the chamber sidewalls by the peripheral edges of said rotor and said second offset being of a depth less than first offset which is just deep enough to minimize excessive oil leakage normally associated with rotors which are offset to prevent gouging.

4,105,377

HYDRAULIC ROLLER MOTOR

William Mayall, 17 Norfolk Ct., Chanctonbury Rd., Rustington, Sussex, England

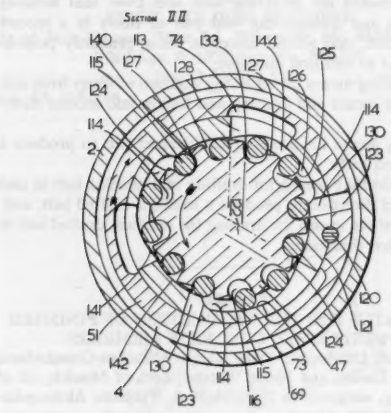
Filed Oct. 15, 1974, Ser. No. 514,834

Int. Cl.[2] F01C *1/24*; F03C *3/00*; F01C *21/08*; E21B *3/12*

U.S. Cl. 418—173 **16 Claims**

1. A rotary positive displacement hydraulic motor comprising a cylindrical rotor embodying in its circumferencial periphery off rotor centre line axially extending angled slots, the trailing face of each slot embodying in its periphery one or more hydraulic fluid directing recesses which have a bottom surface extending obliquely from the rotor's periphery into the trailing face of the said angled slots, said fluid directing recesses acting in combination with the internally profiled housing's inlet ports to lead fluid pressure and flow via the trailing slot face and lateral slot to roller clearance to the under-belly of a roller lodged freely in the slot, said roller being slidably confined longitudinally but having a lateral clearance when retracted of probably one millimeter dependent entirely on the

volume of fluid embodied in said slot which must be exhausted from underneath the roller as the roller is forced to retract into its slot as it passes through the exhaust phase of the working cycle, said rotor and rollers being mounted for free axial rotation into an internally recessed and concentrically profiled contra rotating housing, means connecting the rotor and housing together such that clockwise rotation of one will produce anti-clockwise rotation of the other, said profile being circumferentially divided into a number of equally spaced stations, each station comprising retracted sealing, fluid inlet, driving and exhaust section, inlet port fluid flow and pressure being directed at the required velocity in combination with the fluid directing recesses contained in the rotor's periphery acts to cause the retracted rollers as they pass through or almost through, the incoming inlet fluid to change from the trailing slot face to the leading slot face while still retracted causing the fluid pressure driven rollers to leave their retracted positions and to rise away from the rotor axis while remaining in constant contact with both the leading rotor slot face and the internal housing's profile and to lift their longitudinal axis above the periphery of the cylindrical rotor exposing the underbelly of the now radial extended rollers to fluid flow and pressure which holds them in their operative position in which they produce useful rotation and torque on both the rotor and profiled housing in both clockwise and anti-clockwise direction, said profiled housing embodying exhaust port means whereat the driven driving rollers change from the leading slot face to the trailing slot face acting to cause much of the fluid present under the said rollers and embodied in the external rotors axially extended slots to be exhausted through the lateral clearance gap between slots and rollers and radially in advance of the retracting rollers, said port means being radially probably as long as the pitch between any two rollers but preferably radially longer allowing two or more rollers to be exhausting into the exhaust section simultaneously as they retract into their embodying slots where they are supported in said embodying slots by an under roller cushion of high pressure mud, which mud, because of the pressure drop differential between inlet and exhaust ports, acts to hold said rollers in rolling, sliding and sealing contact between the trailing side of the rollers embodying slots and the smallest concentric periphery of the internal housing.



4,105,378

SEALING ARRANGEMENT

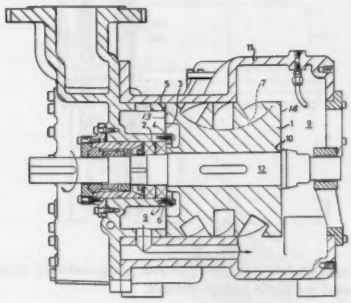
Jonathan Martin Hodge, London, England, assignor to Momovis B.V., Amsterdam, Netherlands

Filed Aug. 9, 1976, Ser. No. 712,743

Claims priority, application United Kingdom, Aug. 18, 1975, 34215/75

Int. Cl.² F04C *17/10*

U.S. Cl. 418—195 **1 Claim**



1. In a positive displacement rotary machine comprising a screw rotatable about an axis and having surface grooves formed therein which are inclined relative to that axis, the lands, serving to separate the grooves one from another, making sealing engagement with a surrounding casing whereby each groove defines, during at least a part of the rotation of the screw within the casing, a chamber, at least one gate rotor having teeth which intermesh with the grooves of the screw, each tooth being successively in sealing relationship with a groove as the intermeshing screws/rotor(s) rotate, the volume of any chamber defined by a groove and limited by a rotor tooth changing from a maximum to a minimum as the screw and rotor(s) rotate, at least a high pressure port in the casing adjacent to a high pressure end of the screw and communicating with each chamber when the volume thereof is at, or adjacent to, its minimum volume and at least a low pressure port at the low pressure end of the screw, the improvement comprising means to establish an effective seal between the screw and the casing at an end of the screw across which a pressure difference occurs, said seal means including a generally radially extending surface of the screw adjacent to the portion of the screw in sealing engagement with the surrounding casing and a part stationary with the casing of same outside diameter as said surface and closely adjacent thereto.

4,105,379

TIRE CURING PRESS

Georges Gazuit, Montlucon, France, assignor to Etablissements Zelant, Gazuit, Montlucon, France

Filed Aug. 11, 1977, Ser. No. 823,685

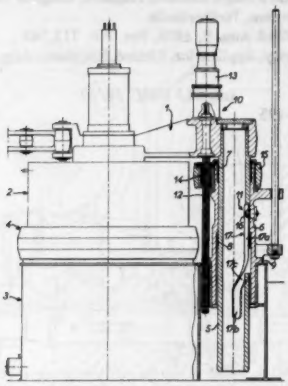
Claims priority, application France, Aug. 25, 1976, 76 25681

Int. Cl.² B29H *5/02*

U.S. Cl. 425—47 **3 Claims**

1. A tire curing press comprising a frame, a mold having an upper part and a lower part supported on said frame, a support fixed to one side of said frame and having a vertical axis, a horizontal cross-member supporting the upper part of said mold, said horizontal cross member being mounted in a cantilever fashion at one of its ends on said support and being able to both pivot about and slide along the vertical axis of the support, a single control means and guide means operatively associated with said single control means to control both the pivoting movements and the sliding movements of said horizontal cross-member, said guide means comprising a cam follower member and a groove forming a cam having two end portions

which extend vertically and which are one another offset vertically and angularly in relation to the vertical axis of the



support, and an intermediate portion progressively connecting the two end portions of the groove.

4,105,380

COOLING APPARATUS FOR AIR COOLING TUBULAR PLASTICS FILM MADE BY A FILM BLOWHEAD

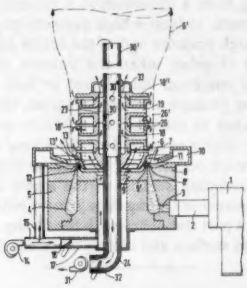
Werner Josef Zimmermann, Lengerich of Westphalia, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Fed. Rep. of Germany

Filed Mar. 14, 1977, Ser. No. 777,051

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1976, 2610818

Int. Cl.² B29F *3/00*

U.S. Cl. 425—72 R **9 Claims**



1. Cooling apparatus for tubular plastics film made by a film blowhead, wherein provision is made for air cooling the tubular plastics film and removal of internal cooling air through a central aperture in the blowhead, the apparatus comprising cooling air supply rings for supporting the film on such inside and having gaplike outlet passageways facing such inside of the film for directing cooling air onto such film and axial pasageways extending axially through the air supply rings for the passage of the cooling air from the lower into the higher air supply rings and radial passageways for withdrawing the cooling air directed onto the film by such outlet passageways between the air supply rings, wherein the improvement comprises the cooling air supply rings being formed of concentric inner and outer cylindrical rings interconnected by tubular webs that define the radial passageways, the radial passageways extending between openings formed in the inner and outer rings, the air supply rings being superposed and supported on one another at least by their inner rings with their inner and outer rings bounding the axial passageways therebetween.

4,105,381

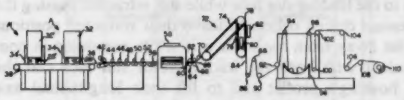
APPARATUS FOR THE PRODUCTION OF A NONWOVEN FABRIC

Louis Platt, Seneca; Marvin Wishman, Greenville, both of S.C.; David R. Gentry, Chamblee, Ga., and Jake E. Williams, Rockwall, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 610,899, Sep. 5, 1975, Pat. No. 4,042,655. This application Jun. 6, 1977, Ser. No. 804,021

Int. Cl.² B29D *27/00*; D04H *18/00*

U.S. Cl. 425—83.1 **5 Claims**



1. Apparatus comprising:

forming means for forming a batt of fibers oriented primarily in a first direction;

carrier means for receiving said batt from said forming means and transporting said batt of fibers in a second direction, said second direction being primarily perpendicular to said first direction;

first drafting means for receiving said batt of fibers from said carrier means and drafting said batt in said second direction;

needling means for needling said drafted batt to produce a needled batt;

second drafting means for drafting said needled batt in said second direction to produce a needled, drafted batt; and

third drafting means for drafting the needled, drafted batt in said first direction.

4,105,382

APPARATUS FOR THE PRODUCTION OF FINISHED PRESTRESSED CONCRETE MEMBERS

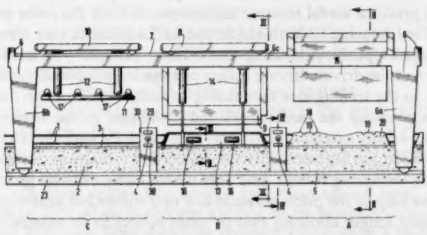
Peter Auer, Ottobrunn; Fritz Kluge, München-Grosshadern; Helmut Lieske, and Horst Wutzler, both of Munich, all of Germany, assignors to Dyckerhoff & Widmann Aktiengellschaft, Munich, Germany

Filed Mar. 22, 1977, Ser. No. 780,021

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1976, 2614036

Int. Cl.² B28B *3/04*

U.S. Cl. 425—88 **16 Claims**



1. An apparatus for producing finished prestressed concrete member comprising a prestressing bed on which said concrete members are produced having prestressing wires tensioned against fixed abutment members passing therethrough, a scaffold spanning said prestressing bed in gantry-like fashion, said scaffold being supported for movement in a direction parallel

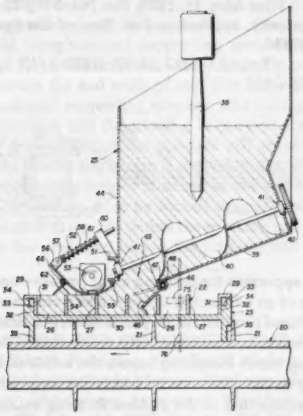
to said prestressing bed, said scaffold longitudinally extending over at least two adjacent stations along said prestressing bed for producing said finished prestressed concrete members, a lower form member for each concrete member to be formed at each of said stations are mounted on said scaffold for vertical movement between a position for receiving concrete to form said concrete members and a position removed from said forming position, and an upper form member for each of said lower form members, each of said upper form members mounted on said scaffold for vertical movement into and out of cooperative engagement with its respective lower form member when in the forming position, said upper form members also being mounted for horizontal movement longitudinally along said scaffold.

4,105,383

BRICK MOLDING MACHINE

David Jack Hanson, River Rd., Newcastle, Me. 04553

Filed Apr. 8, 1977, Ser. No. 786,339
Int. Cl.[2] B28B 5/04
U.S. Cl. 425—96 10 Claims



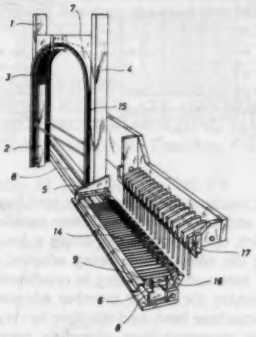
1. A brick molding apparatus comprising a horizontal conveyor, nesting pallets and brick forms traveling on said conveyor, a clay hopper positioned above said conveyor and having a bottom clay outlet at an elevation to deliver clay from the hopper directly into brick mold cavities of said brick forms, vibration means extending into the hopper to vibrate clay therein, clay feed means within the hopper to feed vibrating clay through said bottom clay outlet, a flapper blade pivoted to the bottom of the hopper adjacent said outlet and adapted to enter said mold cavities of the moving brick forms on the conveyor in succession and forcing the clay from said outlet into the forward part of each mold cavity before allowing the clay to fill the rear part of such cavity, said flapper blade adapted to ride over divider walls separating said mold cavities, and a vibrator means near the downstream end of the hopper for contacting each moving form in succession and imparting vibration thereto and including a strike blade element for removing excess clay from the top of each form.

4,105,384

APPARATUS FOR INSERTION OF STICKS IN ICE CREAM BODIES

Ole Christian Mørch, Solrød Strand, Denmark, assignor to Stickma A/S, Herluf, Denmark

Filed Jun. 24, 1976, Ser. No. 699,352
Claims priority, application Denmark, Jun. 25, 1975, 2884/75
Int. Cl.[2] A23G 9/26
U.S. Cl. 425—126 S 8 Claims

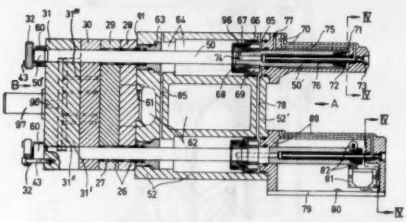


1. Apparatus for positioning sticks in partially frozen ice cream bodies provided in aligned mould cavities which are open at the top, said apparatus comprising a stick supply source in which a supply of sticks is maintained, a plurality of moulds each having an open-topped mould cavity, a vertically movable stick inserting apparatus mounted above said mould cavities including individual stick grasping means for grasping and holding individual sticks and vertically movable support means for said grasping means for effecting insertion movement of said individual sticks into said mould cavities, stick infeed means including a plurality of upwardly facing individual stick receiving and holding slots for receiving sticks from said stick supply source, means supporting said stick infeed means for movement of said stick receiving and holding slots to to a position beneath said stick supply source for receipt of individual sticks in said stick receiving and holding slots to a transfer position adjacent said stick inserting apparatus, transfer means mounted adjacent said stick infeed means for removing sticks from said stick infeed means when said stick infeed means is in said transfer position and positioning said sticks in a vertical removal position for engagement by said grasping means for removal from said transfer means for subsequent insertion into said mould cavities, wherein there are two stick receiving and holding slots for each of said individual stick grasping means and said transfer means consists of plural individual stick holding members equal in number to the number of said receiving and holding slots for simultaneously moving all of said sticks from said receiving and holding slots to said vertical removal position and said grasping means includes individual stick grasping members positioned to initially engage alternate ones of said sticks held by said holding members in said removal position for removal of said engaged sticks from said holding members and subsequent insertion thereof into said mould cavities and wherein said transfer means is adapted for movement to position the sticks remaining on said transfer means for subsequent engagement by said stick grasping members to effect removal of said last-mentioned sticks from said transfer means by said grasping means for subsequent insertion in mould members.

4,105,385
COMPACT DIE CLOSING UNIT FOR INJECTION MOLDING MACHINES

Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Jul. 14, 1977, Ser. No. 815,853
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631603
Int. Cl.² B29F *1/00*
U.S. Cl. 425—192 R 13 Claims



1. In a machine for the injection molding of plastic or metallic parts and articles in an injection molding die, a die closing unit which opens and closes along a longitudinal movement axis, the die closing unit being adapted for mounting on a machine base and comprising in combination:

a stationary die carrier member adapted for attachment to the machine base, said member having on its forward side a die mounting face extending perpendicularly to said movement axis;

at least two hydraulic linear actuators having parallel stationary power cylinders which are solidary with the stationary die carrier member and which enclose an equal number of power pistons, each having a piston rod attached thereto, the piston rods extending forwardly through the stationary die carrier member, on opposite sides of, and parallel to said movement axis;

a stationary die half as part of the injection molding die, said die half being constituted by at least one transversely extending stationary die plate which is clamped against the die mounting face of the stationary die carrier member, said at least one stationary die plate engaging a length portion of each piston rod with a fitted bore, so as to support and guide the piston rods;

a movable die half as part of the injection molding die, said movable die half being likewise constituted by at least one transversely extending movable die plate, said at least one movable die plate having fitted bores engaging a forward end portion of each piston rod, so as to support the movable die half on said rods; and

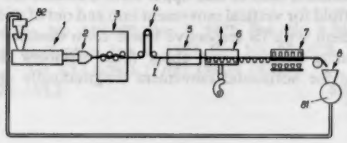
axial clamping means for releasably clamping the forward end portions of the piston rods to a forwardly facing clamping face on the front side of the movable die half.

4,105,386
APPARATUS FOR THE MANUFACTURE OF THIN-WALLED SHAPED ARTICLES OF THERMOPLASTIC MATERIAL

Alfons W. Thiel, Mainz, and Hans Hell, Wiesbaden, both of Germany, assignors to Bellaplast GmbH, Wiesbaden, Germany

Continuation-in-part of Ser. No. 408,083, Oct. 19, 1973, abandoned. This application Aug. 25, 1976, Ser. No. 717,751
Int. Cl.² B29C *29/00*
U.S. Cl. 425—217 37 Claims

1. Apparatus for manufacturing thin-walled articles comprising means including extrusion means for forming a continuous hot plastic web of thermoplastic material, means for continuously advancing said web, means defining a stabilization station through which said web passes and wherein opposite surfaces of said moving web are cooled to provide supportive outer layers therealong, means defining a thermal forming station positioned for receiving said stabilised web and wherein successive areas of said web are subjected to shaping tool operation for forming articles of desired shape in the web, means intermediate said stabilization and thermal forming stations for converting continuous motion of said web into intermittent motion for disposing successive web areas for a predetermined time at said thermal forming station, means providing a dwell station for equalizing the surface tempera-

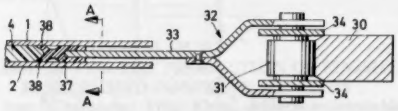


ture conditions of said web within said successive web areas before said respective web areas are disposed at said thermal forming station and means for actuating said web moving means and the shaping tools at said thermal forming station in synchronism and in such correlation with the temperature of said web at extrusion and the speed of advance of the web that the stabilized web arrives at said thermal forming station while it retains sufficient heat for achievement of thermal forming when operated upon by said shaping tools.

4,105,387
SIDE SEALING MEANS FOR A CONTINUOUS PRESS

Karl-Heinz Ahrweiler, Krefeld, Fed. Rep. of Germany, assignor to Eduard Küsters, Krefeld-Forstwald, Fed. Rep. of Germany

Filed May 15, 1975, Ser. No. 577,877
Claims priority, application Fed. Rep. of Germany, May 24, 1974, 2425057
Int. Cl.² A01J *25/12;* B28B *3/12*
U.S. Cl. 425—335 6 Claims



1. In an apparatus for extering a flat pressure on a longitudinal section of an advancing strip such as a continuous press for the continuous production of panel materials being produced under pressure, in which the strip is conducted between endless forming bands extending across the width of the strip and circulating in the direction in which the strip advances with pressure transmitted to the endless forming bands by support structures, the improvement comprising sealing strips which are separate from the forming bands disposed between said bands near their edges and supported to move through the longitudinal section with said bands to laterally seal the space containing said advancing strip in a pressure tight manner, said sealing strips comprising endless circulating sealing strips made of an elastic material and having upper and lower sealing lips with an opening therebetween directed toward the inner space between said forming bands whereby pressure entering said opening from the material between said forming bands will act to force said lips outward to increase sealing against said forming bands, and means supporting said sealing strips such that said sealing strips engage between said forming bands before the beginning of said longitudinal section and disengage from said sealing strips being disposed between said forming bands in a zone in which the forming bands are supported by the support structure said means supporting said sealing strips including means disposed outside said forming bands for circulation in a horizontal plane at the level of the space between

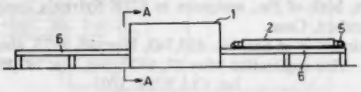
said forming bands such that they engage between said forming bands over said longitudinal section.

4,105,388

HYDRAULIC PRESS

Keijo Hellgren, Vesteras, Sweden, assignor to Asea Aktiebolag, Vesteras, Sweden

Filed Dec. 20, 1976, Ser. No. 752,282
Claims priority, application Sweden, Dec. 23, 1975, 7514607
Int. Cl.² B29C 17/06
U.S. Cl. 425—389 6 Claims



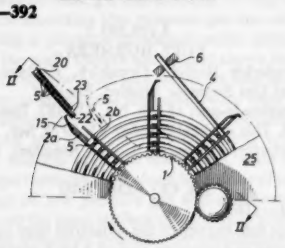
1. In a hydraulic press which includes wall means forming a press area therebetween, a first frame member having top and end walls to form thereby a pressure cell area positioned within said space, an elastic press pad supported against the top of said first frame member, a second frame member mounted within said pressure cell area, a bag-like elastic diaphragm positioned in said pressure cell area between said second frame member and said press pad and having an annular bead which fills an annular slot formed between said second frame member and the top wall of said first frame member, a movable trough-shaped supporting member positioned adjacent the end walls of said first frame member and said press pad such that with expansion of said press pad as a result of expansion of said elastic diaphragm said press pad moves into the trough space of said trough-shaped supporting member, there being a gap between said trough-shaped supporting member and the end walls of said first frame member, and a seal strip positioned in the gap between the end walls of said first frame member and said trough-shaped supporting member, said sealing strip being vertically movable and functioning to prevent the press pad from being pressed out of the pressure cell area through the gap when the elastic diaphragm is expanded, the improvement wherein a supporting strip is attached to the end walls of the first frame member so as to be locked against movement in a vertical direction at a point within the pressure cell area and so as to secure the press pad within the pressure cell area.

4,105,389

METHOD OF WINDING A TUBE COIL, AND AN ARRANGEMENT FOR PERFORMING SAID METHOD

Rolf Paul Näslund, Nyköping; Karl Bertil Ahrbom, Tystberga, and Peter Heinrich Erwin Margen, Nyköping, all of Sweden, assignors to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Jun. 14, 1976, Ser. No. 695,789
Claims priority, application Sweden, Jul. 1, 1975, 7507568
Int. Cl.² B29C 17/02
U.S. Cl. 425—392 12 Claims



1. Apparatus useful for spiral winding of a plurality of flexible tubes in order to form a multiple tube coil, comprising:

(a) a drum;

(b) means for rotating the drum;

(c) first tube spreaders extending substantially radially relative to the drum, for separating at least some adjacent single tube spirals in the axial direction of the drum, at least some of said first tube spreaders being arranged in groups, each of said groups comprising at least three tube spreaders disposed in two substantially parallel planes, said planes extending substantially axially relative to said drum; and

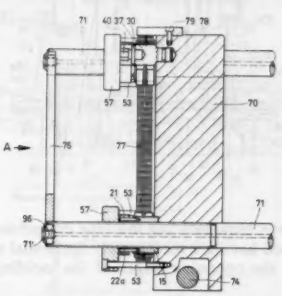
(d) means for inserting second tube spreaders in parallel with the drum axis between at least some adjacent spiral tubes and between the first tube spreaders of a group, the interval between the first tube spreaders of the group located in two planes being not less than the thickness of a second tube spreader.

4,105,390

DIE CLOSING UNIT WITH PLATE ADJUSTMENT MECHANISM FOR INJECTION MOLDING MACHINE

Karl Hehl, Arthur-Hehl-Strasse, 7291 Lossburg, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,578
Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623392
Int. Cl.² B29C 1/16
U.S. Cl. 425—450.1 16 Claims



1. An adjustable die closing unit for an injection molding machine comprising in combination:

a stationary die carrier member having a die mounting face for the attachment thereto of a die plate of an injection molding die;

a plurality of parallel, transversely spaced tie rods rigidly connected to the stationary die carrier member and extending perpendicularly away from its die mounting face;

a hydraulic linear actuator having a cylinder with a stationary member which is rigidly connected to the tie rods, at a longitudinal distance from the stationary die carrier member, and a piston with a piston rod extending parallel to, and centrally between the tie rods, in the direction of the stationary die carrier member;

a movable die carrier member arranged between the stationary die carrier member and the hydraulic linear actuator and having a die mounting face oriented towards the die mounting face of the stationary die carrier member, for the attachment thereto of another die plate of the injection molding die; the movable die carrier member being guided by the tie rods and connected to the piston rod of the linear actuator, to be moved by the latter towards and away from the stationary die carrier member, thereby closing and opening the injection molding die; and

a position adjustment mechanism associated with the tie rods and with one of the two stationary members to which the tie rods are rigidly connected, the position adjustment mechanism including:

tie rod positioning bores in said associated member, the

bores extending from its mounting face to an abutment face on the opposite side of the member;

a threaded length portion of each tie rod protruding beyond said abutment face;

threaded adjustment members seated on the protruding threaded tie rod portions and abutting against said abutment face, each adjustment member having two threaded member portions which are rotatably united, but axially displaceable relative to one another, for a thread-clamping action under an axial load;

means synchronously rotating all the adjustment members on their tie rods; and

means axially clamping the adjustment members against said abutment face, thereby blocking them against rotation, while also creating said thread-clamping action.

4,105,391

INJECTION BLOW MOLDING MACHINE

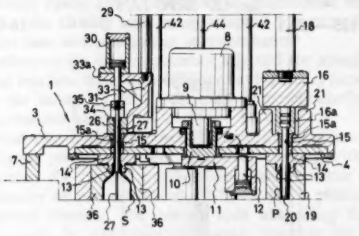
Katashi Aoki, 6037, Ohaza Minamijo, Sakakimachi, Hanishina-gun, Japan

Filed Mar. 9, 1977, Ser. No. 775,836

Claims priority, application Japan, Mar. 12, 1976, 51-026908

Int. Cl.[2] B29D *23/03*

U.S. Cl. 425—526 **4 Claims**



1. An injection blow molding machine comprising:

a machine bed having a substantially horizontal surface for mounting the operating stages of the molding machine thereon;

four operation stages being disposed on the horizontal surface of the machine bed, such stages being an injection molding stage, a heating stage, a stretching and blowing stage and a releasing stage;

a base plate disposed parallel to and above the horizontal surface of the machine bed;

a rotary disk rotatably attached to the under-surface of the base plate;

the rotary disk being provided with four neck molds, each of said neck molds being disposed correspondingly to one of said operation stages;

a motor secured to a middle portion of said base plate, said motor having a drive shaft which passes through the rotary disk;

an arm attached at one end thereof to the lower end of the drive shaft of the motor and at the other end thereof to a connecting pin, the connecting pin means being engagable with the rotary disk to intermittently rotate the rotary disk to respective ones of said operation stages;

a mold closing mechanism associated with the injection molding stage;

a heating core inserting mechanism associated with the heating stage to heat a parison from the injection molding stage;

a stretching and blowing mechanism associated with the stretching and blowing stage to stretch and blow the heated parison from the heating stage;

a molded product releasing mechanism associated with the releasing stage to release the stretched and blown molded product from the stretching and blowing stage;

the mold closing mechanism, heating core, stretching and blowing mechanism, and product releasing mechanism being secured on the periphery of the base plate and positioned respectively in the injection molding, heating, stretching and blowing, and releasing stages;

injection mold, blow molds and heating cylinders being disposed in the space between the machine bed and the base plate; and

hydraulic means associated with each of said mechanisms for the selective actuation thereof.

4,105,392

PHOTOFLASH LAMP

Ronald E. Sindlinger, Muncy, and Emery G. Audesse, Williamsport, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 633,743, Nov. 20, 1975, abandoned. This application May 17, 1977, Ser. No. 797,890

Int. Cl.[2] F21K *5/02*

U.S. Cl. 431—95 R **6 Claims**

1. A photoflash lamp comprising:

an hermetrically sealed, light-transmitting envelope;

a quantity of filamentary combustible material located within said envelope;

a combustion-supporting gas in said envelope;

an ignition means disposed in said envelope in operative relationship with respect to said combustible fill material, said ignition means including first and second lead-in wires extending into said envelope in a spaced relationship, a sleeve of insulating material extending within said envelope about said first lead-in wire, said sleeve being sealed to said envelope at one end and open at the other end of said sleeve, said first lead-in wire extending beyond the open end of said sleeve, said second lead-in wire having an integral terminating portion formed from said wire at an angle therefrom and entirely disposed substantially in a plane which overlies and is spaced from the open end of said sleeve to provide a predetermined gap between said terminating portion and the end of said first lead-in wire extended beyond said sleeve, and a mass of primer material disposed to cover the open end of said sleeve and bridge said gap.

4,105,393

FUEL BURNERS

William Frederick Boylett, Ormskirk, England, assignor to Consultant Gas Engineer Limited, England

Continuation-in-part of Ser. No. 531,187, Dec. 9, 1974, abandoned. This application May 12, 1976, Ser. No. 685,677

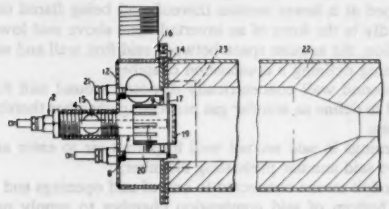
Claims priority, application United Kingdom, Dec. 7, 1973, 56860/73

Int. Cl.[2] F23M *9/02*

U.S. Cl. 431—116 **6 Claims**

1. A fluent fuel burner of the industrial type operating with forced draught and operable against a back pressure, comprising a combustion chamber, a central fuel and primary air introduction means having an enlarged diameter discharge end portion, an air plenum surrounding the said means with a wall separating the air in the plenum from the combustion chamber

and with a hole in said wall through which said portion penetrates with clearance, said portion having apertures putting the plenum into direct communication with the inside of the portion for the metered supply of primary air thereinto which apertures are tangentially so inclined to the axis of the enlarged end that the primary air swirls about that axis, and a flame



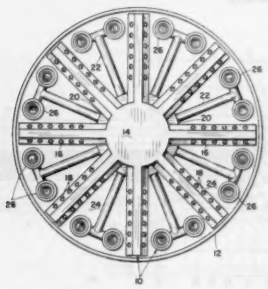
anchor plate extending from said end portion across the hole to neighbour said wall closely and to seal said hole except for a passage around the rim of the anchor plate which passage is so narrow that secondary air from the plenum has to force its way through at a high speed, and consequentially reduced pressure, such that a suction effect is created holding the flame on the rim of the anchor plate.

4,105,394

DUAL PRESSURE FLARE

Robert D. Reed; John S. Zink, and Robert E. Schwartz, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Oct. 18, 1976, Ser. No. 733,143
Int. Cl.² F23Q 9/00
U.S. Cl. 431—202 **10 Claims**



1. A dual pressure burner apparatus for a flare stack, comprising a thin wall circular metal pipe, said burner apparatus comprising:

a first housing providing a first chamber having an inlet port therein for admitting low pressure gas into said chamber and having a plurality of spaced outlet ports extending through the walls thereof and spaced above the inlet port;

a plurality of hollow arms secured to the first housing, each arm being in substantial alignment with each outlet port and extending outwardly from the first housing, each arm having one end in open communication with the first chamber and the opposite end closed, each arm having spaced apertures disposed along both sides of each arm for the escape of low pressure gas said arms extending substantially to the inner surface of said stack, whereby atmospheric air is directly available for combustion of said low pressure gas over the top edge of said flare stack;

means for securing the first housing and arms concentrically inside the flare stack, near the top portion thereof;

a second housing providing a second chamber having an opening for receiving high pressure gas into said second chamber and having an outlet means for discharging said high pressure gas;

a plurality of ducts secured to the second housing in open communication with the outlet means thereof for receiving the high pressure gas, each of said ducts being interposed between adjacent pairs of the low pressure hollow arms and having outlet bore means for discharge of the high pressure gas said outlet bore means for each of said ducts comprising at least one burner having a total high pressure gas flow in close proximity to the inner surface of said flare stack, near the top thereof, whereby atmospheric air is directly available for combustion of said high pressure gas over the top edge of said flare stack;

means attached to each of said ducts in communication with the outlet bore means for burning the high pressure gas; and

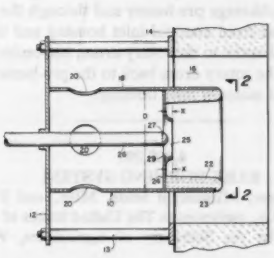
means to supply low pressure air to the inside of said flare stack.

4,105,395

REGENERATIVE TILE STRUCTURE FOR FUEL BURNERS

Hershel E. Goodnight; Robert D. Reed, and Alan D. Witwer, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Nov. 19, 1976, Ser. No. 743,097
Int. Cl.² F23D 15/00
U.S. Cl. 431—351 **5 Claims**



1. A regenerative tile structure for a fluid fuel burner, which comprises:

a substantially cylindrical shell;

an annular shaped refractory sleeve, secured to the inner periphery of the cylindrical shell, and axially disposed in a downstream portion thereof;

a flange-shaped member, secured to the inner periphery of the shell in abuttment with the upstream end of the annular refractory sleeve, and having a coaxially located orifice, the edge of the member forming said orifice projecting in a downstream direction, and having a plurality of circumferentially spaced apertures around the orifice spaced slightly inwardly from the inner periphery of the annular refractory sleeve; and

means for admitting combustion air to the shell upstream from the flange shaped member.

4,105,396

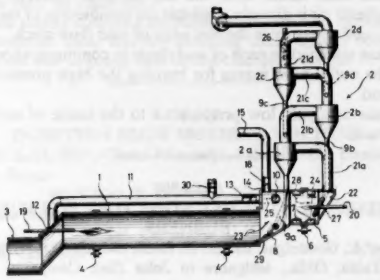
APPARATUS FOR HEAT TREATMENT OF FINE GRAINED MATERIALS

Horst Ritzmann, Enniger, Fed. Rep. of Germany, assignor to Polysius AG, Neubeckum, Fed. Rep. of Germany

Filed Dec. 29, 1976, Ser. No. 755,233
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1976, 2602889
Int. Cl.² F27B 15/00, 7/02
U.S. Cl. 432—14 **5 Claims**

4. In a heat treatment system including an open ended rotary tube furnace, a fixed material inlet housing at one end of the

furnace, a burner at the other end of the furnace, a rotary drum with material lifting members therein adjacent the inlet housing and a multi-stage material pre-heater including a first material outlet in communication with the fixed material inlet housing and a second material outlet in communication with the rotary drum, the method of heat treating fine material comprising the steps of inducing air to flow in sequence through the open ended rotary furnace, through the fixed material inlet housing, through the open ended rotary drum, and through the



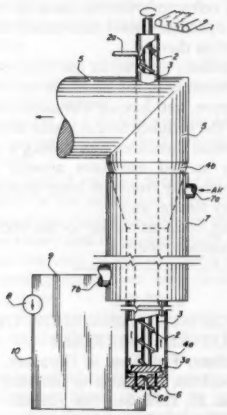
multi-stage material pre-heater, heating the air with the burner as it flows through the rotary furnace, rotating the rotary furnace, rotating the rotary drum at a higher rotary speed than the rotation of the rotary furnace, feeding fine material through the multi-stage pre-heater and through the first material outlet to the fixed material inlet housing and through the second material outlet to the rotary drum, and recirculating the material from the rotary drum back to the pre-heater for delivery to the fixed material inlet housing.

4,105,397

BARK BURNING SYSTEM

Martin T. Jasper, Mississippi State, Miss., and Peter Koch, Alexandria, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 10, 1977, Ser. No. 751,634
Int. Cl.² F27B *19/00*
U.S. Cl. 432—90 **1 Claim**



1. Apparatus for drying and burning particulate bark comprising

(a) an elongated, vertically disposed, downwardly directed feed screw;

(b) means to feed particulate bark to the upper section of said screw;

(c) a vertically-disposed cylindrical housing substantially enclosing said feed screw, said housing terminating above the bottom of said feed screw to provide an egress opening for particulate bark from said screw;

(d) a first wall concentrically disposed around said housing and said egress opening, said wall being cylindrically shaped at it lower section thereof, and being flared outwardly in the form of an inverted cone above said lower section; the annular space between said first wall and said housing defining a combustion chamber;

(e) a second wall concentrically disposed around said first wall to define an annular gas preheating chamber therebetween;

(f) openings in said second wall to permit air to enter and leave said annular preheating chamber;

(g) conduit means connected to one of said openings and to the bottom of said combustion chamber to supply preheated air to the bottom of said combustion chamber; and

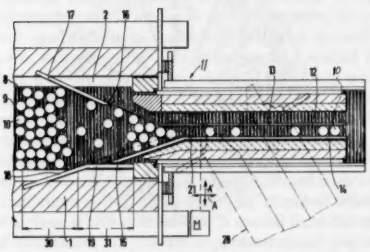
(h) air metering means at the bottom of said combustion chamber to permit said preheated air to entrain particulate bark which enters said combustion chamber from said egress opening disposed below the bottom of said cylindrical housing.

4,105,398

CONTINUOUS PRODUCTION FURNACE TO HEAT RING-SHAPED WORKPIECES

Günther Disch, Gerlingen, and Elmar Noormets, Boblingen, both of Fed. Rep. of Germany, assignors to J. Aichelin KG, Stuttgart, Fed. Rep. of Germany

Filed Nov. 8, 1976, Ser. No. 739,644
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1975, 2550325
Int. Cl.² F27B *9/00*
U.S. Cl. 432—121 **12 Claims**



1. Continuous production roller hearth furnace to heat circular workpieces (10) having

a furnace housing (1) defining a roller hearth furnace chamber (2) and having an inlet opening and an outlet opening,

input driven transport means extending from outside of the housing (1) through the inlet opening into the furnace chamber,

a roller hearth (8) which has a width which is a multiple of the diameter of the circular workpieces to receive a plurality of said workpieces (10) thereon randomly, adjacently positioned;

outlet transport means extending outside of the furnace chamber from the outlet opening to remove heated workpieces therefrom;

and means (11) located adjacent the outlet opening to automatically orient the workpieces in single file for removal of the heated workpieces (10) from the furnace chamber in said single file by the outlet driven transport means and for transport to a receiving station (33), comprising limit means (15–19) defining an outlet path (12) having an inlet width matched to the width of the roller hearth (8) and

extending in a direction of transport of the workpieces (10) through the furnace and narrowing, funnel-shaped, to a width approximately matched to the width of the workpieces (10), said limit means including

at least one side wall (14) formed with an outwardly diverging portion (15) at the region thereof directed toward said chamber (14), located laterally with respect to said path and being cyclically movable with respect to said path (12) in a direction essentially parallel to said path (12);

means (M) coupled to said side wall (14) moving said side wall in said direction essentially parallel to said path;

and driven conveyor means (21) beneath the path to move the workpieces (10) from the chamber (2) outside thereof in single file along said path.

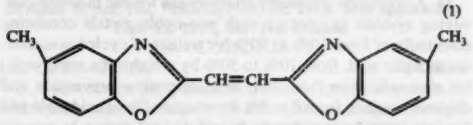
4,105,399

OPTICALLY BRIGHTENING WITH A SYNERGISTIC MIXTURE

Christian Luthi, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

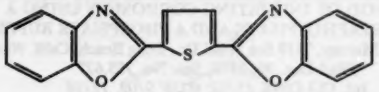
Division of Ser. No. 497,970, Aug. 16, 1976, Pat. No. 4,008,166.
This application Aug. 26, 1976, Ser. No. 717,846
Claims priority, application Switzerland, Sep. 5, 1973, 12736/73
Int. Cl.[2] D06L *3/12*; C11D *7/26*; C09K *13/00*
U.S. Cl. 8—1 W 5 Claims

1. A process for the fluorescent brightening of synthetic and semisynthetic fibers, in particular those of polyester, polyamide or acetyl cellulose, such as cellulose triacetate or, preferably, cellulose acetate, which comprises the step of applying to said fibers an effective amount of a mixture consisting of 33% to 67% of a compound of the formula



(1)

and 67% to 33% of a compound of the formula



(2)

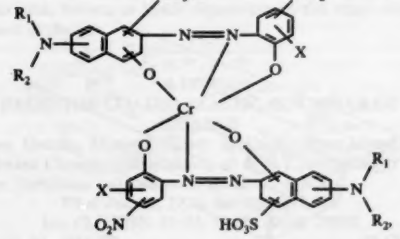
4,105,400

PROCESS FOR DYEING NATURAL PROTEIN FIBRES WITH METALLIC AZO DYES

Gerhard Back, Lörrach, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 460,400, Apr. 12, 1974, abandoned.
This application Mar. 29, 1976, Ser. No. 671,873
Claims priority, application Switzerland, Apr. 17, 1973, 5498/73; Feb. 28, 1974, 2829/74
Int. Cl.[2] C09B *62/00*; D06P *1/38*
U.S. Cl. 8—43 6 Claims

1. A process for dyeing or printing natural protein fibers in deep shades of black, brown or navy blue, comprising the step of applying to the natural protein fibers an aqueous liquor containing a levelling agent and a dye of the formula



wherein R_1 is hydrogen or methyl, R_2 is dibromopropionyl, dichloropropionyl, alpha-bromoacryloyl, alpha-chloroacryloyl or chloroacetyl, and X is hydrogen, nitro, chlorine, methoxy, acetylamino or chloroacetylamino.

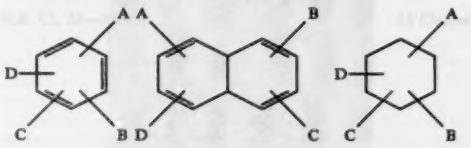
4,105,401

DYE PREPARATION SOLUBLE IN COLD WATER

Zdenek Koci, Binningen, and Hans Mollet, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 19, 1976, Ser. No. 677,945
Claims priority, application Switzerland, Apr. 23, 1975, 5201/75
Int. Cl.[2] C09B *67/00*
U.S. Cl. 8—79 11 Claims

1. A solid preparation, soluble in cold water, manufactured by a process comprising the steps of dissolving at least one anionic dyestuff or optical brightener and at least one anionic compound having hydrotropic activity, selected from the group consisting of



wherein A, B, C and D are each independently hydrogen, SO_3Na, SO_3K, COONa, COOK, OH, NO_2 or alkyl of 1 to 9 carbon atoms, provided that at least one of A, B, C and D is SO_3Na, SO_3K, COONa or COOK, in water at 20° to 95° C at a pH-value of 4.5 to 11.5, and allowing the solution to evaporate to dryness.

4,105,402

TREATMENT OF SULFIDE-LIMED PELTS IN ACID BATHS

Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, both of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed May 3, 1977, Ser. No. 793,407
Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621697
Int. Cl.[2] C14C *1/00, 1/08*
U.S. Cl. 8—94.17 9 Claims

1. In the method of treating sulfide-limed pelts with an acid treating bath, the improvement werein said treating bath contains a water-soluble salt of manganese, cobalt, nickel, titanium, or zirconium and wherein said treating bath is brought into contact with oxygen.

4,105,403

KNITTED COTTON FABRIC DURABLY PATTERNED BY DIFFERENTIAL SHRINKAGE

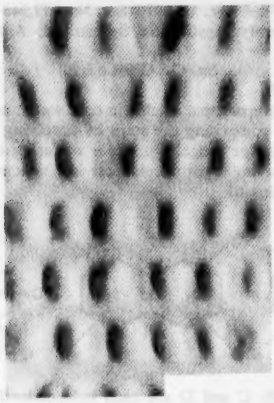
Bethlehem K. Andrews, New Orleans; Robert J. Harper, Jr., and Norton A. Cashen, both of Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 7, 1976, Ser. No. 684,127
Int. Cl.[2] D06Q *1/02*
U.S. Cl. 8—115 1 Claim

1. A process for imparting to knitted cotton textiles the enhancing quality of a novel patterned effect throughout a shrinkage resistant fabric, produced by differential shrinkage in treatment, which process comprises:

(a) applying to selected areas to the surface of a knitted cotton textile, to a wet add-on of about from 20 to 90 weight percent with aqueous solution containing:
  (1) a methylol amide crosslinking agent; and
  (2) an acid catalyst;
(b) drying the moist textile from (a) at a temperature at about 70° C
(c) curing the dry textile from (b) at a temperature at about 160° C
(d) washing the cured textile from (c); and

(e) drying the washed textile from (d), wherein the application is effected by making a portion of the surface of the knitted cotton textile inaccessable to the solution of cross-



linking agent by means of water-resistant adhesive tape placed on the fabric in a geometric design and applying the solution of crosslinking agent to the fabric by kiss-roll padding.

4,105,404

SUBSTITUTED THIOUREAS TO INHIBIT OZONE FADING OF DYED POLYAMIDES

Robert Alden Lofquist, and Peter Reginald Saunders, both of Richmond, Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 233,792, Mar. 10, 1972, abandoned. This application Oct. 1, 1973, Ser. No. 402,543

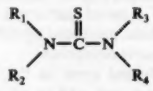
The portion of the term of this patent subsequent to Jul. 9, 1974, has been disclaimed.

Int. Cl.[2] D06P *5/02*

U.S. Cl. 8—165 **7 Claims**

1. A method for improving fastness of dyes when exposed to ozone in nylon fibers dyed with anthraquinone dyes consisting of

coating said fibers with a substance consisting essentially of a compound having the formula



where R_1 is an alkyl having one to eight carbon atoms and R_2, R_3 and R_4 are independently selected from hydrogen or an alkyl having one to eight carbon atoms, said compound containing at last five carbon atoms, so that from about 0.5 to about 5% on weight of fiber of the compound remains on said fiber after subsequent water treatment to substantially reduce the rate of fading due to exposure of fabric of said dyed fiber to ozone.

4,105,405

METHOD AND COMPOSITION FOR INHIBITING CORROSION OF METALS IN CONTACT WITH WATER

Volker Wehle, Hilden, and Jürgen Reiffert, Oberhausen, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 22, 1977, Ser. No. 854,029

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2653933

Int. Cl.[2] C23F *11/12, 11/18, 11/16*

U.S. Cl. 21—2.7 R **14 Claims**

1. A method for inhibiting corrosion of non-noble metals in contact with circulating water comprising the steps of adding to circulating water in contact with non-noble metals from 0.5 to 50 gm/m^3 of at least one cyclohexanehexacarboxylic acid and adjusting said water to a pH of from 6 to 9.

14. A corrosion inhibitory composition for use in water-conveying systems in contact with non-noble metals consisting essentially of from 10% to 90% by weight of cyclohexanehexacarboxylic acid, from 10% to 50% by weight of a water-soluble zinc salt, from 0 to 25% of a concretion prevention and dispersion agent, from 0 to 5% by weight of benzimidazole and from 0 to 2% by weight of a biocidal agent.

4,105,406

METHOD OF INHIBITING CORROSION USING A HEXAMETAPHOSPHATE AND A PHOSPHATE BUFFER

W. Bruce Murray, 7119 Sea Wind Dr., Long Beach, Calif. 90803

Filed Dec. 30, 1976, Ser. No. 755,627

Int. Cl.[2] C09K *15/02;* C23F *9/02, 11/18*

U.S. Cl. 21—2.7 R **12 Claims**

1. A method for inhibition of the corrosion of iron and steel surfaces in contact with water which consists of:

(a) adding to the water a limited amount of an alkali metal hexametaphosphate to provide a concentration therein up to about 30 parts per million, insufficient, used alone, to prevent said corrosion; and

(b) adding to the water a sufficient amount of a phosphate buffer, selected from the group consisting of orthophosphoric acid and alkali metal dihydrogen orthophosphate, to maintain the pH of said water at a value from about 6.5 to about 7.5, whereby said corrosion is inhibited.

4,105,407

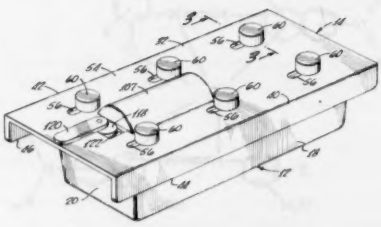
STERILIZING AND STORING MEDICAL ITEMS

Roger S. Sanderson, 24662 Santa Clara Ave., Dana Point, Calif. 92629

Continuation of Ser. No. 571,263, Apr. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 501,183, Aug. 28, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 710,522

Int. Cl.[2] A61L *1/00*

U.S. Cl. 21—56 **7 Claims**



1. A method of sterilizing items comprising the steps of:

placing said items in a rigid reusable container which can be repeatedly subjected to steam;

placing the container in an autoclave with the container

sufficiently open so that the exterior of the container is in fluid communication with the interior;

operating the autoclave to provide a sterilizing cycle including a vacuum environment to withdraw the air from the container followed by a pressure steam environment to sterilize the items, and a final vacuum environment to withdraw the steam from the container and dry the articles in the container; and

automatically sealing said container by means responsive to the environment in the autoclave after the articles have been sterilized but before the final vacuum environment is complete.

4,105,408

UREA ASSAY

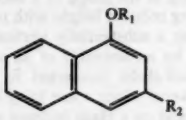
Jerry W. Denney, Carmel, Ind., assignor to American Motor Corporation, Indianapolis, Ind.

Division of Ser. No. 740,612, Nov. 10, 1976. This application Oct. 13, 1977, Ser. No. 841,655

Int. Cl.² G01N *33/16*

U.S. Cl. 23—230 B **3 Claims**

1. A process for the quantitation of urea in a fluid sample, in which the sample is reacted with a reagent containing an acidic solution of o-phthalaldehyde and an acidic solution of a chromogenic compound of the general class consisting of 1, or 1,3-mono- or di-substituted hydroxy or methoxy naphthalene compounds which have the following general formula:



where R_1 = —H, or —CH_3 and
where R_2 = —H, or —OH, or —OCH_3.

4,105,409

METHOD AND REAGENT FOR DETERMINING THE ETHYL ALCOHOL CONTENT OF A GAS

Denys Monnier, Chenes-Bougeries, and Pierre Bolle, Geneva, both of Switzerland, assignors to Lucien Etzlinger, Geneva; Carl Wilhelm Koelker, Baar; Claus H. Grossman, Kusnacht and Multi-Marketing Services AG., Basel, all of Switzerland

Filed Apr. 29, 1977, Ser. No. 792,168

Claims priority, application Switzerland, May 6, 1976, 5711/76

Int. Cl.² G01N *31/22, 33/16*

U.S. Cl. 23—232 R **7 Claims**

1. A reagent for determining the ethyl alcohol content of a gas by means of a color reaction, said reagent consisting of an intimate mixture of (1) iodine pentoxide, (2) a colorless metal nitrate or concentrated nitric acid and (3) 75 to 98% (wt./wt.) sulphuric acid, the original white color of said reagent changing to pink, brown or black depending on the ethyl alcohol content of the gas.

4,105,410

RECEPTOR COATED PLASTIC FOR ASSAY OF LIGANDS

Sidney Gutcho, Monsey; Henry McCarter, Pine Island, and Edward Chanod, Staten Island, all of N.Y., assignors to Becton, Dickinson and Company, Rutherford, N.J.

Filed Jul. 22, 1976, Ser. No. 707,683

Int. Cl.² G01N *29/02, 31/00*; A61K *29/00*

U.S. Cl. 23—253 TP **12 Claims**

1. In a process for coating a receptor for a ligand to be assayed on a plastic substrate, the improvement comprising:

effecting said coating with a solution of the receptor containing a blocking agent for the receptor sites to prevent adherence of the receptor sites to the plastic substrate and a deaggregating agent for the receptor to prevent adherence of the receptor to the plastic substrate in aggregates, said blocking agent having a cross-reactivity with the receptor of from 0.0001 to 5% and which can be displaced by the ligand to be assayed.

11. A plastic substrate having a receptor for a ligand coated thereon produced by the process of claim 1.

4,105,411

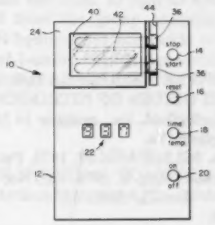
DEVICE FOR DETERMINING THE ACTIVATED CLOTTING TIME OF A BLOOD SAMPLE

William Ralph Biver, Dubuque, Iowa, assignor to Sybron Corporation, Rochester, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,297

Int. Cl.² G01N *33/16*

U.S. Cl. 23—253 R **11 Claims**



1. A device for determining the activated coagulation time of whole blood comprising:

(a) a hand held housing;

(b) an upstanding portion on said housing defining a chamber for receiving a rubber capped glass tube containing a sample of blood to be tested;

(c) said upstanding portion having a window to observe the tube in said chamber;

(d) an electric heater in said housing for maintaining the glass tube and blood sample at substantially 37° C;

(e) a timer in said housing; and

(f) means on said housing to manually start said timer when a blood sample enters the tube and to stop said timer when a clot is observed to form in the blood sample.

4,105,412

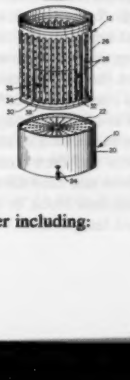
PORTABLE COMPOST CONTAINER

Manfred W. A. Petzinger, Rte. 7, Box 87, Elizabethtown, Ky. 42701

Filed Aug. 4, 1977, Ser. No. 821,684

Int. Cl.² C05F *9/02*

U.S. Cl. 23—259.1 **7 Claims**



1. A compost container including:

(a) a base section providing a housing for receiving liquid fertilizer sap,

(b) support means within and on the upper portion of said base section,

(c) container means, including an inner perforate section into which decomposable garbage and waste is placed and an outer imperforate section removably placed over said perforate section, removably positioned on said support means whereby compost is formed in said container, said inner perforate section including access means near the lower portion thereof for removing compost therefrom, and

(d) at least a portion of the lower portion of said container means being open to permit liquid fertilizer sap to gravitate from said container means with said base section.

4,105,413

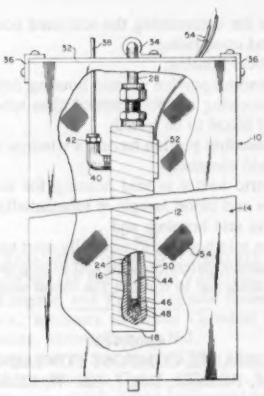
CATALYTIC CONVERTER APPARATUS, ESPECIALLY FOR OXIDES OF NITROGEN

Quade R. Stahl, Springfield, Va., assignor to Meloy Laboratories, Inc., Springfield, Va.

Division of Ser. No. 562,819, Mar. 28, 1975, Pat. No. 3,979,501. This application Aug. 6, 1976, Ser. No. 712,216

Int. Cl.² B01J 8/06

U.S. Cl. 23—288 R **5 Claims**



1. Catalytic apparatus of the type described comprising a metal block having an elongated bore open at one end and closed at the opposite end, a tube within said bore and having an outer surface defining with the inner surface of the bore a thin space therebetween, the interior of said tube containing a catalyst and communicating with said space adjacent to said opposite end of the bore, the open end of said bore being provided with a bore extension having internal threads, said tube having one end connected to and supported by an externally threaded fitting that is threaded into said internal threads and that has a passage therethrough communicating with the interior of the tube at said one end, said tube extending from said fitting and being dimensioned so that the tube can be inserted into said bore through the open end of the bore when the fitting is threaded into the bore extension, means for admitting gas to be treated to said space adjacent to said fitting, said fitting closing said bore extension so that said gas is constrained to flow along said space and then through said tube, means for exhausting said gas from said tube through said fitting passage, and means for heating said block to heat said gas flowing in said space to a desired temperature.

4,105,414

CATALYTIC MUFFLER FOR INTERNAL COMBUSTION ENGINES

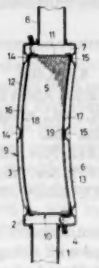
Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Dec. 17, 1976, Ser. No. 751,670

Claims priority, application Italy, Dec. 23, 1975, 30747 A/75

Int. Cl.² F01N 3/15

U.S. Cl. 23—288 F **7 Claims**



1. A catalytic muffler for an exhaust duct of an internal combustion engine of a motor vehicle, including:

(a) an outer casing in the shape of a substantially flattened cylinder, having reduced height with respect to the diameter and having a substantially vertical axis, said casing being defined by an assembly of an upper and a lower sheet metal half-shells connected to one another in a sealed tight manner along a line lying on the outer cylindrical surface and on a plane inclined with respect to the vertical axis, each half-shell being defined by only one piece of metal sheet and including an essentially planar wall of circular outline and a cylindrical side wall, of a height gradually decreasing and having a free edge lying on said inclined plane,

(b) a first gas inlet duct connected to the cylindrical side wall of the upper half-shell at the zone thereof of greatest height,

(c) a second gas discharge duct connected to the cylindrical side wall of the lower half-shell at the zone thereof of greatest height,

(d) a catalyst containing inner casing, having also substantially the shape of a flattened cylinder, namely reduced height with respect to the diameter thereof, mounted in the interior of the outer casing and coaxial therewith, a side annular wall of the inner casing being gas impervious, while upper and lower circular walls of the same are permeable to the gas, whereby the flow of the gases through the catalyst takes place predominantly along a direction which is substantially parallel to the vertical axis of the inner casing, said circular walls being provided with vertically curled edges slipped with circumferential clearance around corresponding edges of said annular wall, means being provided to hold said circular walls in yieldable contact relationship with said annular wall,

(e) a wall having inner and outer edges, said wall having an annular shape and being of corrugated metal sheet lying on the same inclined plane of the edges of said half-shells, the inner edge of said annular corrugated wall being connected to the side annular wall of the inner casing, the outer edge of the corrugated annular wall being connected to the edge of said half-shells,

(f) a chamber defined by the walls of the upper half-shell, the walls of the inner casing and the annular corrugated wall, said chamber communicating with said inlet duct and serving as a manifold for conveying the gases towards the upper circular wall of the inner casing, said chamber including an annular capacity positioned above said annular corrugated wall, said capacity having decreasing

height, which is equal in every point to the height of the cylindrical side wall of the upper half-shell and further including a capacity positioned above the inner casing and having a cylindrical flattened shape, namely having a diameter like that of said inner casing and height much lower than the diameter, and

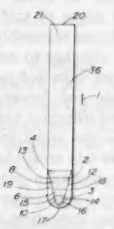
(g) a chamber defined by the walls of the lower half-shell, the walls of the inner casing and the annular corrugated wall, said chamber communicating with the discharge duct and serving as a manifold for the gases coming out of the lower circular wall of the inner casing, said chamber comprising an annular capacity positioned under the annular corrugated wall, said capacity having increasing height, which in every point is equal to the height of the cylindrical side wall of the lower half-shell, and further including a capacity positioned below the inner casing and having a cylindrical flattened shape, namely having a diameter equal to that of the inner casing, but of very reduced height with respect to the diameter.

4,105,415

MULTI-PURPOSE TEST TUBE

Wayne D. Lovett, Rte. 1, P.O. Box 561, Columbia, S.C. 29203

Filed Apr. 21, 1976, Ser. No. 678,976
Int. Cl.² B01L *3/14*; G01N *21/24*
U.S. Cl. 23—292 **5 Claims**



1. A tube, for use in testing specimens in a solution, comprising a tube having an open end at the top, a closed end at the bottom, an upper tube compartment and a bottom section; said bottom section comprising a plurality of vertical, transparent compartments, said transparent compartments being vertically aligned one above another, each of said vertical, transparent compartments forming a flattened section; each of said plurality of vertical, transparent compartments comprising a front piece, a right edge sloping inwardly towards the closed end, a rear piece and a left edge sloping inwardly towards the closed end, said pieces and edges being respectively attached to each other to form said compartments; the lowermost compartment having a bottom comprising a rounded inner surface; a plurality of edges slanting inwardly towards the closed end connecting said vertical, transparent compartments to one another and to the upper tube compartment; whereby sufficient light may pass through solution contained in any one of said plurality of vertical, flattened compartments for changes in said solution to be noticeable, thereby providing information about specimens to be tested.

4,105,416

PROCESS FOR REMOVING SULFUR FROM COAL

Emmett H. Burk, Jr., Glenwood; Jin S. Yoo, South Holland, and John A. Karch, Chicago, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Apr. 12, 1977, Ser. No. 786,911
Int. Cl.² C10L *9/10*; C10B *57/00*
U.S. Cl. 44—1 R **23 Claims**

1. A process for reducing the sulfur content of coal comprising the steps of:

(1) contacting coal particles with an aqueous solution of iron complexing agent, and an oxidant to preferentially oxidize at least a portion of the sulfur in the coal;

(2) contacting the oxidized sulfur-containing coal with at least one hydrogen donor material capable of transferring hydrogen to the oxidized sulfur-containing coal under conditions such that hydrogen transfer occurs; and

(3) recovering coal particles of reduced sulfur content.

4,105,417

FUEL ADDITIVE

Marvin D. Coon, deceased, late of Vallejo, Calif., and by John Hugh MacPherson, agent, 9 Anson Way, Kensington, Calif. 94707

Filed Apr. 11, 1974, Ser. No. 460,234
Int. Cl.² C10L *1/22*
U.S. Cl. 44—63 **3 Claims**

1. A fuel composition comprising a major amount of a liquid hydrocarbon fuel and from 10 ppm to 4,000 ppm of a compound selected from the group consisting of hydrocarbyl phenyl urea, N-hydrocarbyl acetamide of ethylenediamine, and hydrocarbyl-1-aminoethyl oxoimidazolidone, wherein the hydrocarbyl groups contain from 30 to about 400 carbon atoms.

4,105,418

FUELS FOR INTERNAL COMBUSTION ENGINES

Dietrich Fritz Arthur Mohnhaupt, En Cardelay, 1261 Bassins, Switzerland

Continuation of Ser. No. 364,253, May 29, 1973, abandoned. This application Jun. 18, 1975, Ser. No. 588,066
Int. Cl.² C10L *1/18*
U.S. Cl. 44—78 **10 Claims**

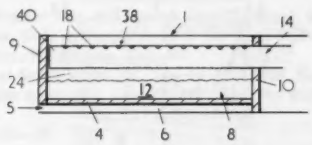
1. A liquid carburetor gasoline composition for internal combustion engines having improved combustion properties and reduced emission of carbon monoxide in the exhaust gases from the engine containing dissolved therein a surface tension lowering amount of 0.5 to 5% by volume of at least one tenside additive capable of lowering the surface tension of said fuel.

4,105,419

FLUIDIZED BED APPARATUS

John Highley, and Michael Alan Vickers, both of Cheltenham, England, assignors to Coal Industry (Patents) Limited, London, England

Filed Mar. 11, 1977, Ser. No. 776,616
Claims priority, application United Kingdom, Mar. 26, 1976, 12197/76
Int. Cl.² C10J *3/54*
U.S. Cl. 48—61 **7 Claims**

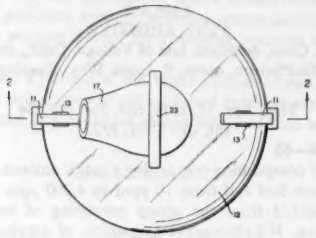


1. A fluidised bed apparatus including a body, a gas-permeable support plate located within the body for supporting, in use, a fluidised bed of particulate material, a gas exit provided in the body, and a baffle assembly interposed between the gas exit and the support plate at a location in use above the fluidised bed, the baffle assembly comprising at least one duct along at least part of the length of the baffle assembly, a number of inlet means in the duct, and passage means within the duct and interconnecting the inlet means and the gas exit, whereby the at least one duct is adapted to allow flow of exit gases around the duct prior to their egress through the inlet means into the passage means.

4,105,420
CANISTER VACUUM CLEANER WITH TRANSPARENT LID

Barnard J. Moore, Venice, Fla., assignor to Bayfront Carpet and Vacuum, Inc., Venice, Fla.

Filed May 23, 1977, Ser. No. 799,698
Int. Cl.[2] B01D *46/00*
U.S. Cl. 55—274 8 Claims



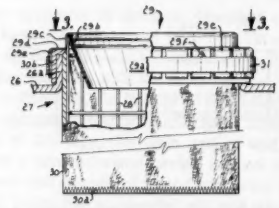
1. A canister-type vacuum cleaner comprising:

a metallic canister body having an opening, a porous bag for filtering dirt particles out of air drawn into said canister body through said opening, means for applying suction to draw air through said bag, a removable lid closing said canister body by being removably mounted over said opening, said lid being entirely made of transparent material, a central aperture disposed in said lid, a sweivel member defining an air passageway into said porous bag disposed in said central aperture, and oppositely disposed embossments in said lid cooperating with oppositely disposed latches on said canister body to removably maintain said lid in air-tight attachment to said canister body with the edge of said porous bag clamped between the edges of said lid and said body opening.

4,105,421
DISPOSABLE FILTER CARTRIDGE

Lamson Rheinfrank, Jr., Kansas City, Mo.; Richard P. Bundy, Prairie Village, Kans., and Jack T. Clements, Raytown, Mo., assignors to Standard Havens, Inc., Kansas City, Mo.

Filed May 28, 1976, Ser. No. 690,886
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—379 11 Claims



1. A cage and diffuser assembly for installation on a tube sheet collar in a baghouse as support for a fabric filter, said assembly comprising:

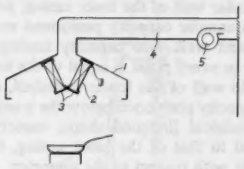
a cylindrical cage having an open upper end; and

an air diffuser secured to the upper end of said cage and having an open central portion projecting interiorly of said cage to direct air thereto, said diffuser further having an outside circular diameter defined by a plurality of downwardly extending flexible fingers adapted to encircle the tube sheet collar for sealing engagement therewith.

4,105,422
FILTRATION DEVICE

Terumasa Kiguchi, Tokyo, Japan, assignor to Kikuchi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1977, Ser. No. 763,837
Claims priority, application Japan, Feb. 2, 1976, 51-10615; May 24, 1976, 51-59752; Sep. 16, 1976, 51-123405[U]
Int. Cl.[2] B01D *45/00*
U.S. Cl. 55—446 12 Claims

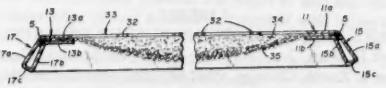


1. A filtration device comprising: a filtration box formed of an upper frame and a separate lower frame; said upper frame including an upper plate having a pair of upper facing sidewalls including a pair of upper flanges extending outwardly from the lower edges of said upper sidewalls respectively; said lower frame including a lower plate having a pair of lower facing sidewalls including a pair of lower flanges extending outwardly from the upper edges of said lower facing sidewall respectively; a support frame releasably securing said separate upper and lower frame together to render said pair of upper flanges in facing abutment with said pair of lower flanges and adjacent opposing upper and lower sidewalls respectively coplanar and to form said filtration box releasably mounted in said support frame; said upper and lower plates each having an array of apertures therein said arrays being offset one from the other; said lower plate having a plurality of frusto-conical intake tubes each having a wide opening mounted over and communicating with the respective aperture in said lower plate; and said upper plate having a plurality of outlet tubes each having one open end thereof mounted over and communicating with the respective aperture in said upper plate; said intake tubes extending interiorly of said filtration box toward said upper plate and said outlet tubes extending downwardly toward said lower plate into the respective spaces between adjacent intake tubes; whereby release of said filtration box from said support frame and separation of said upper and lower frames from each other provides complete access to all the surfaces of said upper and lower frames to permit cleaning thereof.

4,105,423
COMPACT AIR FILTER WITH TUBULAR FRAME

Bernard Latakas, Rosann, Ind.; John E. Copenhefer, Louisville, Ky., and Robert M. House, Wabash, Ind., assignors to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 636,388, Dec. 1, 1975, abandoned. This application May 2, 1977, Ser. No. 792,834
Int. Cl.[2] B01D *46/10*
U.S. Cl. 55—501 9 Claims



1. A compact nestable air filter having a top surface and a bottom surface comprising:

A. a generally rectangular frame formed of an integral suitably cut and scored blank comprising a plurality of interconnected frame members each comprising:

1. a coplanar flange having bottom and top coplanar flange members in juxtaposition, and
2. a flared flange disposed at an angle of less than 180° with respect to said coplanar flange and comprising bottom and top flared flange members both of which are disposed on the same side as and at an angle of less than 180° with respect to said coplanar flange, and an edge panel having one edge thereof integrally connected to an edge of said bottom flared flange member and the other edge thereof integrally connected to an edge of said top flared flange member,

in said frame, said bottom flared flange members being hingedly connected to said bottom coplanar flange members, and said top coplanar flange members being hingedly connected to said top flared flange members, said flared flange members and said edge panels cooperating to define flanges of tubular cross-section in which the upper flared flange member and the lower flared member converge toward each other in a direction away from the edge panel to which they are connected and means securing the edges of the bottom and top flared flange members which are opposite to those which are connected to the edge panel so that said secured edges are fixed with respect to each other,

B. means connecting the ends of adjacent flared flanges together,

C. a perforated bottom cover, and

D. a filter member retained by said coplanar flanges.

4,105,424

METHOD AND APPARATUS FOR SUPPRESSION OF POLLUTION IN MINERAL FIBER MANUFACTURE

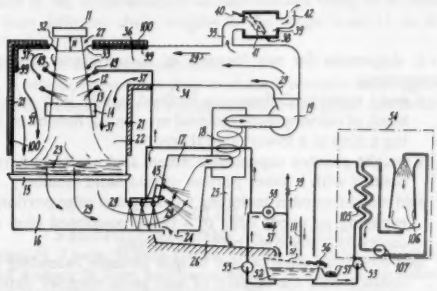
Marcel Levecque, Birchrunville, Pa., and Jean A. Battigelli, Rantigny, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 456,878, Apr. 1, 1974, abandoned, and Ser. No. 557,281, Mar. 11, 1975, Pat. No. 4,052,183, which is a continuation-in-part of Ser. No. 353,983, Apr. 24, 1973, Pat. No. 3,874,886. This application Dec. 3, 1976, Ser. No. 747,433

Claims priority, application France, Oct. 22, 1976, 76 31860; Oct. 10, 1973, 73 36169; Feb. 10, 1975, 75 04039; Mar. 30, 1973, 73.11525

Int. Cl.² C03B 37/04

U.S. Cl. 65—3 C **36 Claims**



20. In the manufacture of fibers by gas blast attenuation of thermoplastic material, the method which comprises establishing a current of the attenuating gas and the attenuated fibers in a forming section having a foraminous fiber collecting device at a boundary of the forming section through which the gas of said current passes and on which the fibers collect to form a blanket, recirculating gas from the downstream side of the collecting device to and through the forming section and the collecting device, and cooling the recirculating gas in the flow path between the collecting device and the forming section.

4,105,425

APPARATUS FOR MANUFACTURE OF MINERAL WOOL

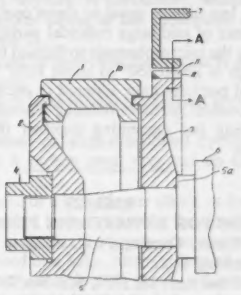
Verner Nielsen, Hellerup, and Hobert Manfred Rasmussen, Hvidovre, both of Denmark, assignors to Rockwool International A/S, Hedehusene, Denmark

Continuation of Ser. No. 716,851, Aug. 23, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 846,954

Claims priority, application Denmark, Sep. 1, 1975, 3916/75

Int. Cl.² C03B 37/04

U.S. Cl. 65—14 **3 Claims**



1. In apparatus for the manufacture of mineral wool which includes at least one high speed horizontally disposed cylindrical rotor, means for directing a flow of liquid melt onto the peripheral surfaces of said rotor during rotation thereof, and an air distribution chamber including means for directing an air flow axially of and along the contour of the rotor for cooling the fibers formed and for transporting said fibers to collecting means; the improvement which comprises providing an annular slot adjacent to, concentric with and radially outwardly of the peripheral surface of each rotor, positioning a plurality of blades in said slot in substantially parallel disposition with each other and with the axis of the rotor and mounted to be rotatable therewith, the blades being thus positioned to provide a series of air flows having axial velocity as well as tangential velocity in the rotational direction of the rotor at the points of introduction thereto equal to the peripheral velocity of the rotor, the distance between the blades being such that the series of air flows integrate to thereby form the cooling and transporting air flow.

4,105,426

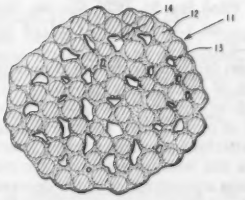
PROCESS FOR MANUFACTURE OF MACROPOROUS MICROSPHEROIDS

Ralph Kingsley Iler, and Joseph Jack Kirkland, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 693,111, Jun. 15, 1976, Pat. No. 4,070,286. This application Aug. 22, 1977, Ser. No. 826,900

Int. Cl.² C03C 17/00

U.S. Cl. 65—18 **4 Claims**



1. A process of producing a powder of discrete, macroporous, microspheroids comprising the steps of:

(a) forming a powder of microspheroids, each having an average diameter in the range of about 2 to about 50 microns, each microspheroid being a coherent aggregate of:

(1) a plurality of large colloidal particles having an average diameter in the range of about 0.1 to about 1.0 micron and each having a surface of silica and a core of material selected from the group consisting of silica and acid-insoluble refractory metal oxides, and

(2) a plurality of small colloidal silica particles having an average diameter of about 1.0 to about 10.0 nanometers, the average diameter of said small colloidal particles being less than or equal to about one-tenth the average diameter of said large colloidal particles, and

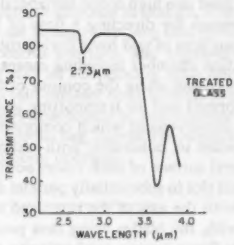
(b) heating the microspheroids so formed to a temperature in the range of about 650° to about 1050° C. until the small colloidal particles have sintered to each other and to the large colloidal particles forming a nonporous silica coating joining and cementing together the large colloidal particles.

4,105,427

PROCESS FOR DEWATERING POROUS GLASS

Thomas H. Elmer, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,707
Int. Cl.² C03C *15/00*
U.S. Cl. 65—30 R **6 Claims**



1. A process for dewatering porous 96% silica glass which comprises the steps of:

(a) contacting the porous glass with water vapor at a temperature ranging from about 30°–150° C. below the annealing point of the glass for a time at least sufficient to enhance the hydroxyl release characteristics of the glass;

(b) heating the porous glass in a dry environment at a temperature below the consolidation temperature thereof for a time at least sufficient to expel hydroxyl groups therefrom; and

(c) consolidating the porous glass to non-porous glass.

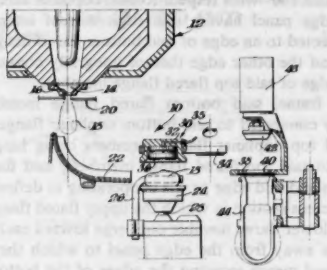
4,105,428

BLOW MOLDED GLASS ARTICLE MANUFACTURE

Terry L. Adams, Orange, Calif., assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Jan. 31, 1977, Ser. No. 764,384
Int. Cl.² C03B *9/14, 23/18, 9/00*
U.S. Cl. 65—77 **5 Claims**

1. A process for forming diverse decorative patterns on the inner surface of diverse blow molded glass articles with the utilization of the same basic equipment comprising forming a discrete gob of molten glass, transporting the gob to an anvil, removably attaching a pattern forming insert on a die, disposing the die in line with the anvil with the removably attached pattern thereon corresponding to the decorative pattern, moving the anvil and die relatively toward each other until the die contacts the gob and the pattern on the die imprints a corresponding pattern on one generally flat horizontal surface of the gob to form a parison therefrom, forming the parison in a generally flat form, transporting the parison to a blow molding station, blowing against the generally flat horizontal imprinted surface of the parison to form a glass article of non-uniform thickness with the imprinted surface comprising the inner surface of the article, detaching the pattern forming insert



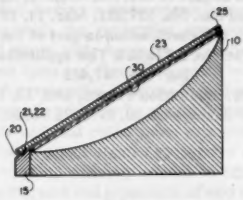
when a different decorative pattern is to be formed, removably attaching to the die a different pattern forming insert corresponding to the different pattern, and repeating the gob forming and transporting steps and the anvil and die contacting and parison transporting and blowing steps.

4,105,429

METHOD AND APPARATUS FOR PRECISION FORMING OF PLASTIC MATERIALS SUCH AS GLASS TO PRECISE DIMENSIONS FROM SHEET MATERIAL

Manuel M. Delgado, 12624 Ocaso, La Mirada, Calif. 90638

Filed May 2, 1977, Ser. No. 792,773
Int. Cl.² C03B *23/02*
U.S. Cl. 65—107 **7 Claims**



1. Apparatus for sag forming of thermoplastic materials comprising;

a mold member defining an inclined cavity into which a blank of thermoplastic material may be sag formed including a stop at a lower edge thereof;

a weight member supportable above said cavity in part by contact with a lower portion of said mold member;

said weight member including an elongated edge portion for engaging an upper edge of a blank positioned over said cavity to apply edge pressure thereto;

said elongated edge of said weight member extending into contact with the surface of said mold member defining said cavity to move downward along said mold member responsive to gravitational force.

6. The process for sag forming thermoplastic shapes from substantially planar blanks comprising:

positioning a mold cavity on an incline;

laying a thermoplastic blank over the mold cavity with the lowermost edge thereof restrained from movement responsive to gravitational force;

applying the pressure of a weight to substantially the entire edge of the blank opposite the lowermost edge while heating said blank, said weight being in slidable engagement with the mold cavity whereby the blank sags into the

cavity under its own weight plus the edge pressure applied thereto by said weight; and
cooling the formed blank.

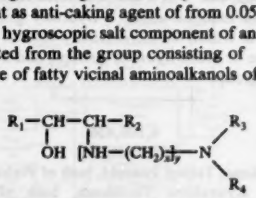
4,105,430
FERTILIZER COMPOSITIONS CARRYING AN AMINOALKANOL AS ANTICAKE AGENT

Karlheinz Koch, Haan, and Wolfgang Rupilius, Dusseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, both of Fed. Rep. of Germany

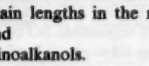
Filed May 5, 1976, Ser. No. 683,321
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1975, 2525568
Int. Cl.[2] C05C *1/00*
U.S. Cl. 71—59 **16 Claims**

1. A composition in particulate, free-flowing form consisting essentially of a hygroscopic salt component which normally cakes on storage having a uniformly distributed, effective surface content as anti-caking agent of from 0.05% to 0.2% by weight of said hygroscopic salt component of an aminoalkanol material selected from the group consisting of

(1) a mixture of fatty vicinal aminoalkanols of the formula:



wherein R_1 and R_2 each represent a substituent selected from the group consisting of H and unbranched alkyl having from 1 to 18 carbon atoms, and the sum of the carbon atoms in R_1 and R_2 is from 9 to 18; R_3 and R_4 each represent a substituent selected from the group consisting of H, C_{1-4} alkyl and C_{2-4} hydroxyalkyl; and x represents a value from 2 to 6 and y represents a value from 0 to 1, inclusive, the



units in the aminoalkanols of said mixture being of at least two different chain lengths in the range from 11 to 20 carbon atoms; and

(2) salts of said aminoalkanols.

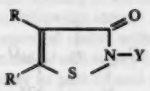
7. A composition according to claim 1 wherein said hygroscopic salt component is a water-soluble, inorganic salt fertilizer.

4,105,431
3-ISOTHIAZOLONES AS BIOCIDES

Sheldon N. Lewis, Willow Grove; George A. Miller, Glenside, and Andrew B. Law, Levittown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 836,660, Jun. 25, 1969, Pat. No. 3,761,488, which is a continuation-in-part of Ser. No. 672,437, Oct. 3, 1967, Pat. No. 3,523,121, which is a continuation-in-part of Ser. No. 621,780, Mar. 9, 1967, abandoned. This application Jun. 8, 1973, Ser. No. 368,168
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—67 **27 Claims**

1. A composition for inhibiting the growth of bacteria, fungi, or algae comprising an agronomically-acceptable carrier and, in an amount which is effective to adversely affect the growth of bacteria, fungi, or algae, a compound of the formula



wherein Y is (1) an unsubstituted alkyl group of 1 to 18 carbon atoms,

(2) a substituted alkyl group having at least one hydrogen atom replaced by hydroxy, halo, cyano, alkylamino, dialkylamino, phenylamino, halophenylamino, carboxy, carbalkoxy, alkoxy, aryloxy, or carbamoxy, wherein the total number of carbon atoms in the substituted alkyl group does not exceed 18,

(3) an unsubstituted or halo-substituted alkenyl group of 2 to 18 carbon atoms,

(4) unsubstituted or halo-substituted alkynyl group of 2 to 18 carbon atoms,

(5) an unsubstituted or alkyl-substituted cycloalkyl group having a 3 to 6 carbon atom ring and up to 12 carbon atoms,

(6) an unsubstituted or a halo-, lower alkyl-, or lower alkoxy-substituted aralkyl group wherein the total number of carbon atoms in the aralkyl group does not exceed 10, or

(7) an unsubstituted or a halo-, nitro-, lower alkyl-, or lower carbalkoxy-, substituted aryl group wherein the total number of carbon atoms in the aryl group does not exceed 10,

R is hydrogen, halogen, or a $(C_1–C_4)$alkyl group, and

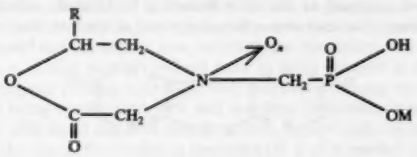
R′ is hydrogen, halogen, or a $(C_1–C_4)$alkyl group or a salt of a compound of the above formula with a strong acid.

4,105,432
CYCLIZED DERIVATIVES OF N-(2-HYDROXYALKYL)-N-PHOSPHONOMETHYLGLYCINE COMPOUNDS

Van R. Gaertner, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 18, 1977, Ser. No. 816,616
Int. Cl.[2] C07F *9/38*; A01N *9/36*
U.S. Cl. 71—86 **30 Claims**

1. A compound of the formula



wherein *n* is zero or one, M is hydrogen or alkali metal, and R is hydrogen, methyl, ethyl, hydroxymethyl, lower alkoxymethyl or lower alkenoxymethyl.

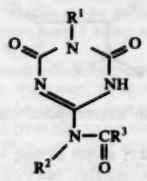
11. A herbicidal composition comprising an inert adjuvant and a herbicidally effective amount of a compound of claim 1.

4,105,433
SELECTIVE HERBICIDES

David John Collins, Ascot; Ian Trevor Kay, Wokingham, and John Walter Slater, Maidenhead, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 20, 1976, Ser. No. 650,754
Claims priority, application United Kingdom, Feb. 5, 1975, 4885/75
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—93 **6 Claims**

1. A process of selectively controlling the growth of graminaceous weeds in a non-graminaceous crop, which comprises applying to the locus of said crop a triazine-dione compound of the formula:



or a herbicidally effective salt thereof wherein R^1 is an alkyl radical of 3 to 5 carbon atoms in which the carbon atom attached to the ring nitrogen atom is a secondary or tertiary carbon atom; R^2 is an alkyl radical of from 3 to 5 carbon atoms, the alkyl radical being such that no carbon atom of the radical is linked through a linear sequence of more than two carbon atoms to the nitrogen atom to which R^2 is attached; and R^3 is a methyl, ethyl or cyclopropyl group, the amount of the triazinedione compound applied being sufficient to control the growth of the graminaceous weeds, but insufficient to substantially damage the crop.

4,105,434

HERBICIDAL 5,5'-BIS-1,2,4-TRIAZINYLS

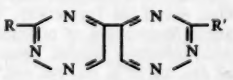
William W. Paudler, Tuscaloosa, Ala.; Robert E. Moser, Mentor, and Norman M. Pollack, University Heights, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jan. 17, 1977, Ser. No. 760,033
Int. Cl.² C07D *253/06*; A01N *9/22*
U.S. Cl. 71—93 **21 Claims**

1. A method for controlling undesired plant life which comprises applying to the situs thereof a herbicidally effective amount of at least one active compound of the formula:

wherein R and R' are the same or different and represent hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylamino, di-(C_1–C_4-alkyl) amino, C_1–C_4 alkylsulfonyl, azido, or a group —OA wherein A is a cation, R'' and R''' are the same or different and represent hydrogen or C_1–C_4 alkyl, the alkyl moieties of said R, R', R'' and R''' being branched or straight chain and the N-oxide derivatives thereof.

16. A compound of the formula:



wherein R and R' are the same and selected from propoxy, butoxy, azido, alkali metal hydroxide, methylamino, dimethylamino or methylsulfonyl; or wherein R and R' are different and independently selected from methylthio and methoxy; or wherein R and R' are the same and selected from dimethylamino or dimethoxy and the 1,1'-hetero nitrogen atoms are substituted by oxygen to form the N-oxides thereof.

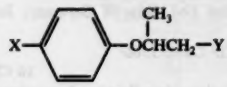
4,105,435

HERBICIDAL COMPOUND, HERBICIDAL COMPOSITION CONTAINING THE SAME, AND METHOD OF USE THEREOF

Ryuzo Nishiyama, Takatsuki; Ryohei Takahashi, Tokyo; Kanichi Fujikawa, Kyoto; Rikuo Nasu, and Nobuyuki Sakashita, both of Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Filed Oct. 22, 1976, Ser. No. 734,913
Claims priority, application Japan, Oct. 29, 1975, 50/129313; Apr. 23, 1976, 51/46800; Jul. 30, 1976, 51/90315
Int. Cl.² A01N *9/22*; C07D *405/04*
U.S. Cl. 71—94 **11 Claims**

1. A compound having the general formula (I):



(I)

wherein X is a 5-halopyridyl-2-oxy group or a 3,5-dihalopyridyl-2-oxy group; and Y is a member selected from the group consisting of a halogen atom, a hydroxy group, a (C_1–C_4) alkoxy group in which the alkyl moiety thereof may be substituted with one or more hydroxy groups, and a (C_1–C_4) alkylcarbonyloxy group.

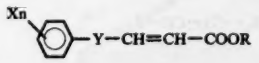
4,105,436

HERBICIDE

Tsuneyuki Takeno; Tetsuji Iwasaki, both of Wakayama; Norioki Miyamoto; Kyozaburo Tachibana, both of Sakura, and Masamoto Matsukane, Funabashi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1977, Ser. No. 822,548
Claims priority, application Japan, Oct. 18, 1976, 51/124602
Int. Cl.² A01N *9/14*
U.S. Cl. 71—103 **9 Claims**

1. A method of controlling weeds which comprises applying thereto an effective amount of at least one compound of the formula;



wherein X represents a halogen atom or an alkyl sulfinyl or alkyl sulfonyl group having 1 to 3 carbon atoms, *n* represents an integer of 0 to 3, Y represents SO or SO_2, and R represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms.

4,105,437

METHOD AND APPARATUS FOR RECOVERING METALS

Hsin Liu, 40-25 Hampton St., Elmhurst, N.Y. 11373

Division of Ser. No. 507,153, Sep. 18, 1974, Pat. No. 3,944,412. This application Nov. 17, 1975, Ser. No. 632,769
Int. Cl.² C22D *7/00*
U.S. Cl. 75—10 R **28 Claims**

1. A method for producing a stabilized plasma comprising the steps of:

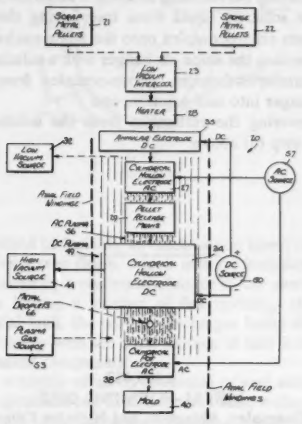
(a) establishing a predetermined high level vacuum condition within the interior of an enclosure;

(b) establishing a level of background gas within the interior of the enclosure;

(c) applying a direct current potential to a first pair of electrodes spaced apart from one another to form a direct current plasma extending adjacent the electrodes, the electrodes of the pair being spaced apart from one another substantially along the central axis of the enclosure extending along the length thereof, the direct current plasma formed adjacent the electrodes being in a substantially

cylindrical configuration of predetermined maximum diameter extending along the central axis of the enclosure;

(d) applying an alternating current potential to a second pair of electrodes spaced apart from one another along the central axis of the enclosure to form an alternating current plasma extending adjacent the electrodes, the alternating current plasma formed adjacent the second pair of electrodes being in a substantially cylindrical configuration extending along the central axis of the enclosure and occupying a portion of the same space as occupied by the direct current plasma along substantially the entire extent of the direct current plasma, the plasma intensity of said alternating current plasma extending radially to the sides of said second pair of electrodes, at least one of said second pair of electrodes being of a smaller radial dimension than either of said first pair of electrodes, whereby the cylindrical radius of said direct current plasma is greater than the cylindrical radius of said alternating current plasma substantially along the length of the enclosure, the direct current plasma and alternating current plasma thereby being spacially superimposed on one another to the outer edge of said radius of said cylindrical alternating current plasma; and



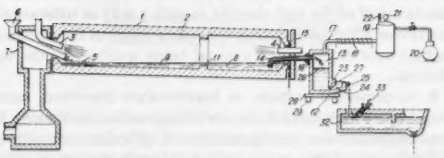
(e) providing an axial magnetic field extending substantially along the central axis of the enclosure and substantially enclosing the superimposed plasmas, whereby the alternating current plasma has a positive voltage versus current relationship.

4,105,438

CONTINUOUS METAL MELTING, WITHDRAWAL AND DISCHARGE FROM ROTARY FURNACES

William Lyon Sherwood, 6968 Ash St., Vancouver, British Columbia, Canada

Filed Apr. 19, 1977, Ser. No. 788,995
Int. Cl.[2] C21C *7/10*
U.S. Cl. 75—49 **10 Claims**



1. In a method for continuous melting and refining in a rotary furnace in which a charge of liquid metal is confined within the furnace by retaining it behind an annular dam restriction of the discharge opening at the furnace discharge end; the combination of the following steps:

(a) maintaining an external metal withdrawal vessel proximate to discharge end of said rotary furnace incorporating an enclosed chamber as part of said vessel;

(b) maintaining a discharge siphon tube inserted down into the metal within the rotary furnace and extending out laterally through the discharge opening to connect into said enclosed chamber;

(c) externally applying a negative suction pressure to said enclosed chamber, also thereby providing for evacuation of any dissolved gases emanating from the molten metal within the chamber as a result of said negative pressure;

(d) allowing the molten metal to flow from the metal bath within the furnace through the opening of said siphon tube into the metal inlet of said enclosed chamber at a rate controlled by the magnitude of said negative suction pressure;

(e) controlling the rate of metal flow through said inlet by controlling the magnitude of said negative suction pressure; and

(f) allowing the metal to flow out and discharge concurrently from a submerged opening in the enclosed chamber under the influence of gravity, and this flow taking place at an average rate corresponding to the rate of withdrawal from the furnace through said siphon tube.

4,105,439

METHOD FOR PRODUCTION OF REFINED STEEL

Thomas Malcolm Barnes, Bulter, Pa., assignor to Harsco Corporation, Harrisburg, Pa.

Filed May 31, 1977, Ser. No. 801,786
Int. Cl.[2] C21B *3/04;* **C21C** *5/00*
U.S. Cl. 75—51 **11 Claims**

1. In a method of producing successive heats of refined steel wherein successive charges of molten, impure iron are refined by oxygen in the presence of at least one flux to form molten, refined steel and liquid slag, followed by the separation of said molten, refined steel and liquid slag, the improvement wherein a liquid slag from one of said refining operations is brought into contact with and caused to react with a batch of molten, impure iron prior to its being charged in a subsequent refining operation, such that at least some of the free and combined iron contained in said slag is substantially reduced and dissolved into said molten, impure iron, and such that the molten, impure iron is at least partially refined prior to being charged in said subsequent refining operation, said successive refining operation being coordinated with said reactions of molten, impure iron with liquid slag such that the molten, impure iron comprising the charge for a refining operation $(N + y)$ is reacted with the liquid slag from a prior refining operation $(N - x)$ during at least one of the refining operations in the sequence $(N - x + 1, \ldots, N, \ldots, N + y - 1)$, wherein:

N represents any one of the refining operations in the succession,

x is any whole integer equal to or greater than 1 and

y is any whole integer equal to or greater than 1.

4,105,440

PROCESS FOR REDUCING METAL HALIDES BY REACTION WITH CALCIUM CARBIDE

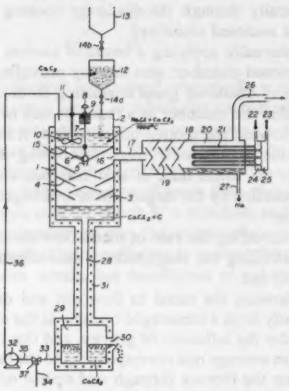
Claude Gentaz, Grand-Lancy, Switzerland, and Gérard Bienvenu, Annemasse, France, assignors to Battelle Memorial Institute, Carouge, Switzerland

Continuation-in-part of Ser. No. 69,719, Sep. 4, 1970, abandoned. This application Jan. 2, 1974, Ser. No. 429,704
Claims priority, application Switzerland, Sep. 5, 1969, 13482/69; Aug. 7, 1970, 11907/70
Int. Cl.[2] C22B *27/00*
U.S. Cl. 75—66 **3 Claims**

1. A process for obtaining a desired alkali metal, selected

from the group which consists of sodium, potassium, rubidium and caesium, from a halide thereof, comprising the steps of:

forming a solvent bath by melting a mixture of said halide of the desired alkali metal and a halide of at least one alkaline-earth metal selected from the group which consists of calcium, strontium and barium;



homogenizing the molten mixture;

dissolving calcium carbide in the homogenized mixture; and

reacting the dissolved calcium carbide in said bath with said halide of the desired alkali metal for a period and at a temperature sufficient to bring about a reduction of the last-mentioned halide.

4,105,441

COMPOSITION FOR THE DECOMPOSITION OF SODIUM-MERCURY AMALGAM

Harshad M. Patel, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 11, 1976, Ser. No. 666,027

Int. Cl.² C22B *43/00*

U.S. Cl. 75—81 **12 Claims**

1. Granular packing for decomposing sodium-mercury amalgam comprised of a solid mixture of a thermally stable porous polymer matrix having embedded therein discrete particles of a surface active composition, wherein said surface active composition is selected from the group consisting of iron, cobalt, nickel, graphite, molybdenum, vanadium and mixtures thereof, wherein the proportion of said thermally stable polymer to said particles of surface active composition is in the range from about 20 to about 80% by volume of the resulting dispersion, wherein said thermally stable polymer is selected from the group consisting of polyphenylene sulfide, polyphenylene oxide, phenolic resins, polymers of furfuryl alcohols, imid polymers, silicone polymers, epoxy polymers, furan polymers, urethane polyphenylene sulfides, polyvinylidene fluorides, polyacrylonitrile, and polyvinyl alcohol, and wherein the particle size of said surface active composition is in the range from about 75 to about 1,000 microns.

4,105,442

SEPARATION AND PURIFICATION OF RUTHENIUM

Monika M. Fieberg, Johannesburg, and Roderick I. Edwards, Honeydew, both of South Africa, assignors to The National Institute for Metallurgy, South Africa

Filed Jun. 15, 1977, Ser. No. 806,819

Claims priority, application South Africa, Jun. 21, 1976, 76/3680

Int. Cl.² C01G *55/00*

U.S. Cl. 75—101 BE **14 Claims**

1. A process for the recovery of ruthenium from solutions thereof which are substantially free from platinum, palladium and gold said process comprising the successive steps of:

(1) boiling the solution together with an oxidant to cause any osmium present to be driven off as osmium tetroxide in the vapor phase;

(2) treating the resulting solution with a reducing agent in the presence of nitric acid to form a solution containing a nitrosylruthenium complex;

(3) adding hydrochloric acid to the solution containing the nitrosylruthenium complex to form the chlorocomplexes of the ruthenium and any iridium and rhodium present;

(4) reducing any iridium present in the resultant chloroplex-containing solution to reduce Ir(IV) to Ir(III);

(5) contacting the resulting solution with an anion exchanger in the solid or liquid form transferring the nitrosylruthenium chlorocomplex onto the anion exchanger;

(6) contacting the anion exchanger with a solution to extract the nitrosylruthenium chloro-complex from the anion exchanger into said solution; and

(7) recovering the ruthenium from the solution resulting from step (6) above.

4,105,443

METAL-FORMING DIES

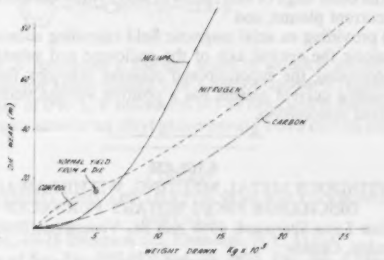
Geoffrey Dearnaley, Abingdon, and Nicholas Edmund Whittam Hartley, Chilton, both of England, assignors to United Kingdom Atomic Energy Authority, England

Filed Jan. 25, 1977, Ser. No. 762,252

Claims priority, application United Kingdom, Jan. 28, 1976, 3421/76

Int. Cl.² B05D *3/06*

U.S. Cl. 75—238 **19 Claims**



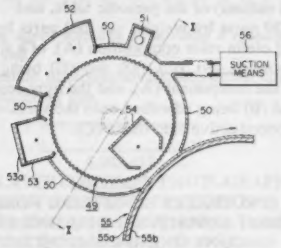
1. A method of treating a metal working tool element made of cemented carbide materials, as hereinbefore described, comprising the operation of implanting into a working surface of the tool element ions of a material such as to interact with the matrix metal of the tool element in such a way as substantially to prevent adhesion between the matrix metal of the cemented carbide tool element and a metal being worked by the tool element.

8. A cemented carbide, as hereinbefore described, metal-working tool element having a working surface into which has been implanted ions of a material such as to interact with the matrix metal of the cemented carbide tool element in such a way as substantially to prevent adhesion between the matrix metal of the cemented carbide tool element and a metal being worked by the tool element.

4,105,444
AIR FLOW METHOD OF CLEANING ION MODULATION PHOTOSENSITIVE SCREEN DURING CORONA CHARGING

Yukimasa Shinohara, Yokohama; Katsunobu Ohara, Kawasaki, and Yujiro Ando, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1976, Ser. No. 729,692
Claims priority, application Japan, Oct. 15, 1975, 50-124002
Int. Cl.² G03G *13/00, 15/02, 15/22*
U.S. Cl. 96—1 R **19 Claims**



1. In a method of forming an electrostatic latent image on a photosensitive screen drum, which method includes applying corona discharge by a corona discharger to the photosensitive screen drum having a number of fine openings through its circumferential wall, the corona discharger being disposed in facing relationship with the outer surface of said screen drum, the improvement comprising:

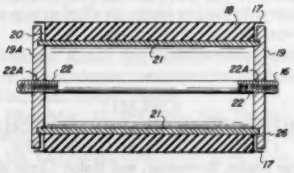
providing a supply of air to the inside of said screen drum, via a longitudinal end of said screen drum, without passing said supply of air inwardly through the fine openings of said screen drum, and

causing said supply of air to flow outwardly from the inside of the screen drum through the fine openings thereof, at least adjacent to and towards the corona discharger, to prevent foreign matter from being deposited on the screen drum while the corona discharger applies corona to said screen drum from the outside of said screen drum.

4,105,445
RESILIENT ARCUATE SURFACE CONTAINING PHOTOCONDUCTOR

Lional Agustin Wilson, Redbourn; John Wales, Bishop's Stortford, and William Ernest George Plumtree, Ware, all of England, assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 14, 1975, Ser. No. 567,575
Claims priority, application United Kingdom, May 29, 1974, 23709/74
Int. Cl.² G03G *5/04*
U.S. Cl. 96—1.5 R **8 Claims**



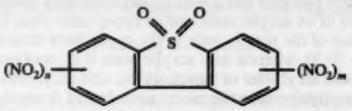
1. A resilient arcuate member which comprises a rigid support member, a flexible arcuate imaging member comprising a photoconductive material coated on a conductive flexible substrate, a resilient member which separates said support and said imaging member and a means for tensioning the resilient member in such a way that separation results in a spacing dimension reduced in an amount sufficient to allow easy movement of the flexible surface with respect to the resilient member.

4,105,446
ORGANIC PHOTOCONDUCTIVE COATING COMPOSITIONS CONTAINING TRICYANOVINYL COMPOUNDS FOR ELECTROPHOTOGRAPHY

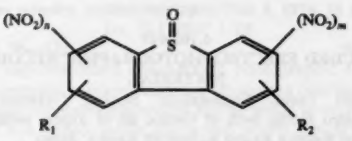
Lyong Sun Pu, Minami-ashigara, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 15, 1976, Ser. No. 649,545
Claims priority, application Japan, Jan. 21, 1975, 50-008339; Jan. 21, 1975, 50-008340
Int. Cl.² G03G *5/04*
U.S. Cl. 96—1.5 R **5 Claims**

1. An electrophotographic element comprising a support and an organic photoconductive layer formed on said support, said photoconductive layer consisting essentially of (a) an organic photoconductive material, (b) about 0.001 to about 1.20 moles of a nitro derivative selected from the group consisting of a nitro derivative of dibenzothiophenedioxide having the following general formula



wherein m and n are independent integers and $1 \leqq m+n \leqq 4$, and a nitro derivative of dibenzothiophenesulfoxide having the following general formula



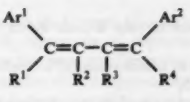
wherein m and n are independent integers and $1 \leqq m+n \leqq 4$, and R_1 and R_2 are independently hydrogen, an alkyl group containing from 1 to 7 carbon atoms, a phenyl group,an acetyl group, a carboxyl group, a cyano group or a halogen atom, and (c) about 0.001 to about 1 mole of a tricyanovinyl compound, substances (b) and (c) each being based on 1 mole of the organic photoconductive material or 1 mole of the starting monomer when a polymeric material is used as the organic photoconductive material.

4,105,447
PHOTOCONDUCTIVE INSULATING COMPOSITIONS INCLUDING POLYARYL HYDROCARBON PHOTOCONDUCTORS

Charles J. Fox, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 14, 1975, Ser. No. 595,955
Int. Cl.² G03G *5/06, 5/09*
U.S. Cl. 96—1.6 **14 Claims**

1. A photoconductive insulating composition comprising an admixture of an electrically insulating polymeric binder, a photoconductor having the formula



wherein Ar^1 and Ar^2, which can be the same or different, each represents a phenyl or a naphthyl group which is unsubstituted

or substituted with alkyl or alkoxy having 1 to 10 carbon atoms; R^1, R^2, R^3 and R^4, which can be the same or different, each represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms or a phenyl group and, when both R^1 and R^4 are hydrogen, both R^2 and R^3 are phenyl groups, and

from about 0.001 to about 30% by weight of the total composition weight of a sensitizer for the photoconductor selected from the group consisting of a pyrylium dye salt and a Lewis acid.

4,105,448

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE LAYER AND MARKING METHOD

Hajime Miyatuka; Takashi Saida, and Satoru Honjo, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 25, 1975, Ser. No. 607,521

Claims priority, application Japan, Aug. 23, 1974, 49-96193

Int. Cl.² G03G *5/087*

U.S. Cl. 96—1.8 **12 Claims**

1. A material to be marked and machined comprising a conductive base having coated thereon an electrophotographic photosensitive layer comprising finely divided photoconductive powders and a resin binder consisting essentially of a mixture of an acrylic resin and an epoxy ester resin in a ratio by volume of the acrylic resin to the epoxy ester resin of about 10:90 to 70:30, wherein said acrylic resin is a copolymer of an acrylic acid alkyl ester or a methacrylic acid alkyl ester with at least one copolymerizable monomer selected from the group consisting of crotonic acid, acrylic acid, itaconic acid, maleic anhydride, a hydroxyalkyl acrylate or methacrylate, a dihydroxyalkyl acrylate or methacrylate, an aminoalkyl acrylate or methacrylate, a dialkylaminoalkyl acrylate or methacrylate, a glycidyl acrylate or methacrylate, or styrene.

4,105,449

EXTRUDED ELECTROPHOTOGRAPHIC RECORDING MATERIAL

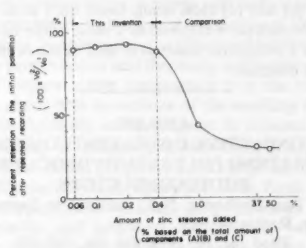
Tadayoshi Tanei, Nagaokakyo; Shigeki Nakamura, and Masahiro Hotta, both of Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 450,241, Mar. 11, 1974, abandoned. This application Jun. 21, 1977, Ser. No. 808,776

Claims priority, application Japan, Aug. 17, 1973, 48/92682

Int. Cl.² G03G *5/087*

U.S. Cl. 96—1.8 **10 Claims**



1. An electrophotographic recording material formed by extrusion, which comprises

(A) a blended olefin resin composition consisting essentially of

(a) an olefin resin having a melt index of 0.1 to 20 g/10 minutes, and

(b) an olefin resin having a melt index of 30 to 300 g/10 minutes,

the weight ratio of olefin resin (a) to olefin resin (b) ranging from 5:95 to 95:5,

(B) 0.025 to 40 parts by weight, per 100 parts by weight of the blended olefin resin composition (A), of at least one light-sensitizing organic compound selected from the group consisting of organic dye compounds, electron accepting organic compounds and electron-donating organic compounds,

(C) 200 to 600 parts by weight, per 100 parts by weight of the blended olefin resin composition (A), of particulate photoconductive zinc oxide having an average particle diameter of 0.1 to 5 microns,

(D) 0.06 to 0.4 part by weight, per 100 parts by weight of the total of the components (A), (B) and (C), of a salt formed between a saturated or unsaturated fatty acid containing 12 to 20 carbon atoms and a metal of Group IIa, IIb or IVb (except radium) of the periodic table, and

(E) 1 to 20 parts by weight, per 100 parts by weight of the blended olefin resin composition (A), of a silicone polymer, the components (B), (C), (D) and (E) being uniformly dispersed in the component (A), and the light-sensitizing organic compound (B) being adsorbed onto the surface of the particulate photoconductive zinc oxide (C).

4,105,450

SPECTRALLY SENSITIZED POSITIVE LIGHT-SENSITIVE O-QUINONE DIAZIDE CONTAINING COMPOSITION

Fumiaki Shinozaki, and Tomoaki Ikeda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Continuation of Ser. No. 492,816, Jul. 29, 1974, abandoned. This application May 25, 1976, Ser. No. 689,874

Claims priority, application Japan, Jul. 27, 1973, 48-85332

Int. Cl.² G03F *7/08*; G03C *1/54*

U.S. Cl. 96—33 **8 Claims**

1. A process for producing a positive image from a light-sensitive element comprising a lithographic support having thereon a coated layer of a positive light-sensitive composition containing (a) an o-quinonediazide type, positive light-sensitive substance selected from the group consisting of o-quinonediazide sulfonic acid esters and amides and o-quinonediazide sulfones and in admixture therewith in an effective amount to enhance sensitivity of the o-quinonediazide (b) at least one compound selected from the group consisting of (1) 5-methylthiazoline-2-thione; and R_4 represents a hydrogen atom, an alkyl group or a cycloalkyl group; and (2) o-benzoic acid sulfimide to form a planographic printing plate said process comprising image-wise exposing of the planograhic printing plate to actinic radiation and treating the exposed planograhic printing plate with the developer solution containing at least one alkali material, thereby obtaining a positive oleophilic image for planographic printing.

5. A positive light-sensitive composition containing: (a) an o-quionediazide type, positive light-sensitive substance selected from the group consisting of o-quinonediazide sulfonic acid esters and amides and o-quinonediazide sulfones and in admixture therewith in an effective amount to enhance sensitivity of the o-quinonediazide (b) at least one compound selected from the group consisting of:

(1) 5-methylthiazoline-2-thione wherein R_3 represents a hydrogen atom, an alkyl group, an aralkyl group, and R_4 represents a hydrogen atom, an alkyl group or a cycloalkyl group; and

(2) o-benzoic acid sulfimide.

4,105,451

PHOTOTHERMOGRAPHIC MATERIAL, COMPOSITION AND PROCESS

James George Smith, Rochester, and Ralph Clyde Reed, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,391

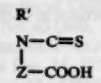
Int. Cl.² G03C *1/02, 1/72, 1/34*

U.S. Cl. 96—66 T **39 Claims**

1. A method of preparing a photothermographic composition comprising sequentially mixing the following components:

(1) a dispersion comprising a 2-mercaptobenzothiazole, 2-

mercaptobenzimidazole, 2-mercaptobenzoxazole or 2-mercaptobenzoselenazole compound and a silver salt of a heterocyclic thione represented by the formula:



wherein R' represents atoms completing a five-member heterocyclic nucleus and Z is alkylene containing 1 to 30 carbon atoms,

(2) a reducing agent solution comprising a reducing agent,

(3) a binder, and

(4) a silver halide photosensitive composition containing a spectral sensitizing dye.

4,105,452
MULTI-LAYERED COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

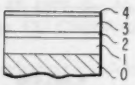
Keisuke Shiba; Toshiaki Aono; Seiiti Kubodera; Takeshi Hirose; Reiichi Ohi, and Tadao Shishido, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 494,955, Aug. 5, 1974, abandoned. This application Apr. 2, 1976, Ser. No. 672,922

Claims priority, application Japan, Aug. 3, 1973, 48-87723

Int. Cl.² G03C *3/00, 1/06, 7/00*

U.S. Cl. 96—74 **5 Claims**



1. A multi-layered color photographic light-sensitive material which provides a negative image upon exposure to an original and subsequent development, said material comprising a support having thereon at least two light-sensitive silver halide emulsion layers which provide images having substantially different hues, wherein at least one of said light-sensitive silver halide emulsion layers or a colloidal layer of said light-sensitive material contains (1) a hydroquinone derivative or a hydroquinone precursor, said derivative and said precursor being substituted with both a heterocyclic monothio group and at least one member selected from the group consisting of an aliphatic monothio group and an aryl monothio group, and said derivative and said precursor having a ballasting group containing 8 or more carbon atoms; and (2) a 2-equivalent coupler and/or a 4-equivalent anilino-pyrazolone coupler.

4,105,453
COLORED LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL WITH COATING ADDITIVE

Yasumasa Numata; Kunio Ito; Keiichi Mori, and Yoshitami Ōno, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

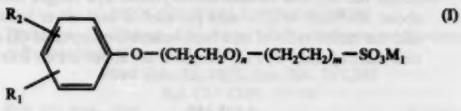
Filed Mar. 11, 1977, Ser. No. 776,743

Claims priority, application Japan, Mar. 29, 1976, 51-33544

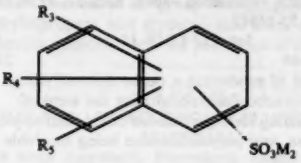
Int. Cl.² G03C *1/38, 1/02, 1/78, 1/76*

U.S. Cl. 96—114.5 **8 Claims**

1. In a light-sensitive silver halide photographic material which comprises a hydrophilic colloid layer containing a basic mordant and an acidic dye and an adjacent layer thereto, the improvement which comprises a hydrophilic colloid layer containing a compound having the following formula (I) and the adjacent layer containing a compound having the following formula (II):



wherein R_1 and R_2 each represent hydrogen, alkyl having 1 to 18 carbon atoms or phenyl which may be substituted; *n* represents 1 to 20; *m* represents zero or 1; and M_1 represents a cation;



wherein R_3, R_4 and R_5 each represent hydrogen, alkyl having 1 to 12 carbon atoms, provided that the combined carbon number of R_3, R_4 and R_5 is not more than 18; and M_2 represents a cation.

4,105,454
SILVER HALIDE PHOTOGRAPHIC EMULSION SPECTRALLY SENSITIZED WITH MEROCYANINE DYES

Tadaaki Tani, Minami-ashigara, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 2, 1977, Ser. No. 765,023

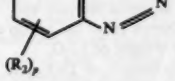
Claims priority, application Japan, Feb. 5, 1976, 51 11730

Int. Cl.² G03C *1/08*

U.S. Cl. 96—122 **10 Claims**

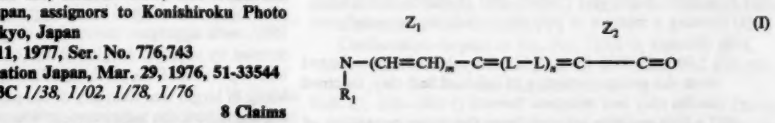
1. A supersenzitized silver halide photographic emulsion which contains, in supersensitizing amounts, a combination of (1) at least one merocyanine dye free of acidic groups and (2) at least one benzotriazole compound which can produce a slightly soluble silver salt by reaction with silver ion, where the solubility product of the resulting silver salt is smaller than that of silver chloride wherein:

said benzotriazole compound has the following general formula (II):



wherein *p* represents an integer from 1 to 4; and R_2 represents a halogen atom or an alkyl group containing from 1 to 3 carbon atoms;

said merocyanine dye free of acidic groups has the following general formula (I):



wherein *m* represents an integer of 0 or 1; *n* represents an integer of 0 to 2; R_1 represents an aliphatic group or an aryl group; Z_1 represents the non-metallic atoms necessary to complete a 5- or 6-membered nitrogen-containing heterocyclic ring; Z_2 represents the non-metallic atoms necessary to complete a 5- or 6-membered nitrogen-containing heterocyclic ring; and L represents a methine group; and

wherein the amount of said merocyanine dye ranges from about 10^{-6} mol to 10^{-2} mol per mol of said silver halide and the molar ratio of said benzotriazole compound (2) to said merocyanine dye (1) ranges from about 2:1 to 100:1.

4,105,455

METHOD OF PRODUCING DENSE SINTERED SILICON CARBIDE BODY FROM POLYCARBOSILANES

Kazunori Koga, and Saburo Nagano, Kyoto, both of Japan, assignors to Kyoto Ceramic Kabushiki Kaisha, Kyoto, Japan

Filed Aug. 12, 1977, Ser. No. 824,062

Claims priority, application Japan, Aug. 17, 1976, 51-98292; Feb. 16, 1977, 52-16543

Int. Cl.² C04B *35/56*

U.S. Cl. 106—44 **21 Claims**

1. A method of producing a dense sintered silicon carbide body from polycarbosilane comprising the steps of:

(A) Polymerizing an organosilicon compound to yield polycarbosilane, said polycarbosilane being insoluble and unmeltable;

(B) Pulverizing said polycarbosilane so as to form a powder; and

(C) Hot pressing said powder so as to produce said dense sintered silicon carbide body by charging said powder into a hot press mold, heating said powder in a nonoxidizing atmosphere to thereby decompose said powder thus producing silicon carbide, and sintering said silicon carbide under pressure.

4,105,456

CERAMIC MATERIAL OF LOW THERMAL EXPANSION COEFFICIENT AND METHOD OF MANUFACTURING THE SAME

Toshiaki Murakami, Hino; Shigeru Waku, Tokyo; Akira Demura, Tokorozawa, and Toshiaki Fujishiro, Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo and Nippon Tsushin Kogyo Kabushiki Kaisha, Kawasaki, both of Japan

Filed Jan. 12, 1977, Ser. No. 758,813

Claims priority, application Japan, Feb. 4, 1976, 51-10417

Int. Cl.² C04B *33/26*

U.S. Cl. 106—46 **8 Claims**

1. A process for preparing a ceramic material having a thermal expansion coefficient close to that of silicon comprising:

(a) forming a mixture of powders consisting essentially of:

(i) zircon;

(ii) 5.00 – 30.00% by weight of a calcined clay selected from the group consisting of calcined ball clay, calcined kaolin clay and mixtures thereof; and

(iii) an additive selected from the group consisting of

1.00 – 5.00% by weight of Li_2O,

1.00 – 10.00% by weight of TiO_2, and

2.00 – 10.00% by weight of $ZnZrSiO_5$, calculated on a Zno basis;

(b) molding the mixture; and

(c) firing the molded mixture at a temperature in the range of 1200° to 1450° C.

5. A process for preparing a ceramic material having a thermal expansion coefficient close to that of silicon comprising:

(a) forming a mixture of powders consisting essentially of:

(i) zircon;

(ii) 5.00 – 30.00% by weight of a calcined clay selected from the group consisting of calcined ball clay, calcined kaolin clay and mixtures thereof;

(iii) a first additive selected from the group consisting of

1.00 – 5.00% by weight of Li_2CO_3, calculated on a Li_2O basis,

1.00 – 10.00% by weight of TiO_2, and

2.00 – 10.00% by weight of ZnO; and

(iv) a second additive selected from the group consisting of

2.00 – 15.00% by weight of CoO,

2.00 – 15.00% by weight of Co_2O_3,

2.00 – 15.00% by weight of Co_3O_4, and

1.00 – 5.00% by weight of MgO;

(b) molding the mixture; and

(c) firing the molded mixture at a temperature in the range of 1200° to 1450° C.

4,105,457

BRIQUET AND METHOD OF MAKING SAME

Wolfgang B. Pietsch, Matthews, N.C., and Charles A. Schroer, De Bordieux Colony, S.C., assignors to Midrex Corporation, Charlotte, N.C.

Continuation-in-part of Ser. No. 682,418, May 3, 1976, Pat. No. 4,032,352. This application Jun. 22, 1977, Ser. No. 808,929

Int. Cl.² C04B *35/16*

U.S. Cl. 106—78 **6 Claims**

1. A metallized iron briquet consisting essentially of from about 85 percent to about 95 percent directly reduced metallized iron and from about 5 percent to about 15 percent of a binder comprising:

(a) from about 15 to about 40 percent hydrated lime,

(b) from about 15 to about 45 percent liquid sodium silicate, and

(c) up to 60 percent water.

4,105,458

ROAD SURFACES

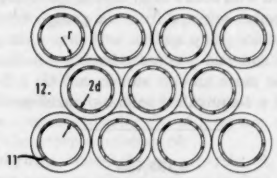
Geoffrey Lees, Stratford upon Avon; Arthur Roger Williams, Birmingham, and Robert Bond, Lichfield, all of England, assignors to Dunlop Limited, London, England

Continuation of Ser. No. 510,702, Sep. 30, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,655

Claims priority, application United Kingdom, Oct. 9, 1973, 47060/73

Int. Cl.² C04B *7/02*

U.S. Cl. 106—97 **4 Claims**



1. In a road surface comprising a blend of at least two aggregate materials disposed in a binder matrix and having different rates of wear as judged by the aggregate abrasion test B.S. 812 1967, each aggregate material having a surface micro-texture defined by asperity heights in the range 5 to 500 microns, at least a portion of the particles of the slower wearing aggregate being of larger size than any of the particles of the faster wearing aggregate, the improvement wherein each aggregate particle is of a size such that it would be retained on a British Standard $\frac{1}{4}$ inch sieve, or its metric equivalent, and would pass through a British Standard $\frac{3}{4}$ inch sieve or its metric equivalent, and wherein the individual aggregate particles are disposed in the binder matrix so that the shortest distance between any two adjacent particles is 1 to 6 mm and the texture depth of the aggregate particles in the binder matrix is between 1 and 5 mm.

4,105,459

SILICEOUS ASHES AND HYDRAULIC CEMENTS PREPARED THEREFROM

Povindar Kumar Mehta, El Cerrito, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 437,068, Jan. 28, 1974, abandoned, which is a division of Ser. No. 276,133, Jul. 28, 1972, abandoned. This application Dec. 15, 1975, Ser. No. 640,893

Int. Cl.² C04B 7/02

U.S. Cl. 106—98 1 Claim

1. A relatively anhydrous composition comprising from 10 - 50% by weight of portland cement, said portland cement having from about 60 to 69% by weight of combined and uncombined CaO; and from about 32 to about 90% by weight of SiO_2 in the form of a highly reactive, amorphous anhydrous silica material derived from organic agricultural matter, having an initial silica content expressed as SiO_2 of up to about 28%, said silica material comprising from about 49 to about 98% SiO_2, characterized by complete absence of crystalline silica as determined by x-ray diffraction analysis; balance being minor impurities and residual carbon, said carbon removable upon prolonged heating to give a composition containing from about 0.3 to about 2% residual carbon, and from 1.0 to about 5% minor impurities, other than CaO.

4,105,460

PROCESS FOR THE ENDOTHERMIC CALCINATION OF RAW MATERIAL

Steven Gottlieb, No. 9 "Karoola", 442-446 Edgecliff Rd., Edgecliff, New South Wales 2027, Australia

Filed Jan. 19, 1977, Ser. No. 760,289

Int. Cl.² C04B 7/02

U.S. Cl. 106—100 7 Claims

1. A process for the endothermic calcination of raw material, which is performed at a temperature lower than that required for a sintering step or a chemical reaction performed in a following rotary kiln, comprising the steps of

pelletizing the raw material,

feeding the thus formed pellets downward through a vertical calciner in the form of a bed consisting of packed pellets,

supplying heat from an axially disposed burner through the calciner in a downward stream,

supplying the flue gases of the rotary kiln to the calciner for forming an upwards directed countercurrent flow turbulently passing at a high velocity through the interstices between the closely packed pellets, and

introducing air through a discharge grate provided at the lower end of the calciner by means of a flap provided at a duct leading to the rotary kiln such that a substantial portion of the fuel injected into the calciner will initially be gasified within the calciner and will then be brought to combustion by means of said air.

4,105,461

THICKENING COMPOSITIONS CONTAINING XANTHAN GUM, GUAR GUM AND STARCH

Joseph S. Racciato, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 26, 1976, Ser. No. 717,844

Int. Cl.² C08L 3/00, 5/00

U.S. Cl. 106—205 9 Claims

1. A thickening composition consisting essentially of from about 5 to about 90 weight % of xanthan gum, from about 5 to about 90 weight % of guar gum, and from about 5 to about 90 weight % of starch ether, the xanthan gum being unmodified by a polyvalent cation and being unmodified by heating in a dry state before blending with the guar gum, the composition exhibiting a synergistic increase in viscosity compared to the additive viscosities of the individual components.

4,105,462

NON-CRYSTALLIZING ROSIN

Theologos E. Thanos, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,303

Int. Cl.² C08L 93/04

U.S. Cl. 106—218 6 Claims

1. A hard, non-crystallizing rosin composition comprising a distilled tall oil rosin containing less than 5% by weight fatty acids and an amount of hard rosin ester sufficient to prevent crystallization wherein said hard rosin ester is produced by mixing and reacting a composition consisting essentially of rosin and a member of the group consisting of pentaerythritol, trimethylolpropane and glycerol, said hard, non-crystallizing rosin having approximately the properties of the starting rosin.

4,105,463

LIME-FLY ASH-AGGREGATE-SLUDGE PAVING MATERIAL

Donald Irvin Angelbeck, Perrysburg, Ohio, assignor to The University of Toledo, Toledo, Ohio

Filed Dec. 11, 1975, Ser. No. 639,893

Int. Cl.² C04B 1/00

U.S. Cl. 106—120 4 Claims

1. In a pozzolanic paving material consisting essentially of lime, fly ash, aggregate, and water; the improvement consisting of from 0.5 to 4 percent by weight, based on said lime, fly ash and aggregate, of a water treatment sludge consisting essentially of at least one compound selected from the group consisting of calcium oxide and calcium carbonate, and at least one compound selected from the group consisting of the oxides and hydroxides of aluminum and iron.

4,105,464

PROCESS FOR THE PRODUCTION OF PIGMENT-SYNTHETIC RESIN CONCENTRATES

Günter Osswald, Hanau, and Hans Gräf, Rodenbach, both of Germany, assignors to Deutsche Gold- and Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Jul. 3, 1975, Ser. No. 592,861

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1974, 2433562

Int. Cl.² C08K 3/04

U.S. Cl. 106—307 36 Claims

1. A process for the production of a carbon black containing pigment-synthetic resin concentrate comprising coagulating an aqueous polyethylene lyophilic sol containing dispersed carbon black pigment, said lyophilic sol being either (a) alkaline or (b) acid, said coagulation being carried out with intensive mixing by an addition of an electrolyte which shifts the pH, said electrolyte being acid reacting when said sol is alkaline and said electrolyte being alkaline reacting when said sol is acid, separating the coagulate from the aqueous phase and drying the coagulate.

4,105,465

TREATED HYDRATED ALUMINA

Sidney Ethan Berger, Rye, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 727,670, Sep. 29, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,391

Int. Cl.² C09C 1/40

U.S. Cl. 106—308 Q 6 Claims

1. A composition comprising alumina trihydrate particles containing on their surfaces a silane, its hydrolyzates or resulting condensate, which silane possesses at least two to about three hydrolyzable groups bonded to the silicon thereof and an organic group which contains a polyalkylene oxide group, said silane being present on the surfaces of said particles in an amount from about 0.25 weight percent to 5 weight percent of the composition.

4,105,466

METHOD FOR REDUCING THE VISCOSITY AND FOR REFINING KAOLIN CLAYS

Albert C. Kunkle, and Carl E. Kollmar, Jr., both of Macon, Ga., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 731,141, Oct. 12, 1976, Pat. No. 4,030,941, which is a continuation-in-part of Ser. No. 591,737, Jun. 30, 1975, abandoned. This application Mar. 25, 1977, Ser. No. 781,241

The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.

Int. Cl.[2] C09C *1/42*

U.S. Cl. 106—309 20 Claims

1. A method for increasing the brightness of crude kaolin clay ores for producing clay pigments comprising contacting a clay/water slurry of said crude kaolin clay with an inorganic polymer complex having the general formula:

$$[Al(OH)_yA_{3-y}]_x$$

wherein $x = 6$ to 24, $y = 1.0$ to 2.75 and A is selected from the group consisting of Cl^-, $(SO_4^{--})_{0.5}$ and NO_3^-; subjecting the crude clay/water slurry to a high shear mixing action or kneading; fractionating the crude clay/water slurry to form coarse and fine fractions of said clay; and leaching the fine fraction of the classified clay/water slurry with from 2 to 3 lbs. of zinc hydrosulfite per ton of clay.

4,105,467

PROCESS FOR TWO-STAGE DIGESTION OF NATURAL PRODUCTS CONTAINING XYLANE, IN ORDER TO OBTAIN XYLOSE

Hans Buckl, Freising-Tümtenhausen; Bernd Brenner, Moosburg, and Wolfgang Eisenschmid, Au, Hallertau, all of Germany, assignors to Sud-Chemie Aktiengellschaft, Munich, Germany

Filed Oct. 4, 1976, Ser. No. 729,231

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2545111

Int. Cl.[2] C13K *13/00, 1/02;* C07C *29/00*

U.S. Cl. 127—37 8 Claims

1. In a process for the production of xylose or xylitol wherein a vegetable material is contacted with a basic substance and the solid residue is thereafter treated with an acid, the improvement which comprises:

(a) employing as the vegetable material stone nut shells;

(b) employing as the basic substance a 1.5 to 6 molar alkali metal hydroxide at a temperature of 10° to 50° C.;

(c) thereafter diluting the resultant digestion mass to an alkali metal hydroxide content of no greater than 0.75 molar and further digesting the stone nut shells at a temperature of greater than 60° C.

4,105,468

METHOD FOR REMOVING DEFECTS FROM CHROMIUM AND CHROMIUM OXIDE PHOTOMASKS

Robert Andrew Geshner, Warren, and Joseph Mitchell, Jr., Kinnelon, both of N.J., assignors to RCA Corp., New York, N.Y.

Continuation of Ser. No. 684,965, May 10, 1976, abandoned. This application Jun. 9, 1977, Ser. No. 805,153

Int. Cl.[2] C23G *1/02*

U.S. Cl. 134—3 12 Claims

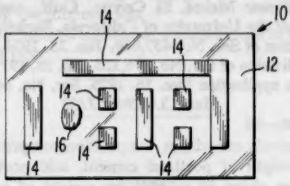
6. A method for removing portions of material from a substrate comprising the steps of:

(a) selecting a substrate having applied thereon an opaque material selected from the group consisting of chromium and chromium oxide;

(b) electrically isolating areas which are to be removed from other areas of said opaque material which are to remain;

(c) applying acid at least adjacent the portions of the materials which are to be removed; and

(d) contacting only those portions which are to be removed by a metallic probe.



11. The method of claim 6 wherein electrically isolating the material to be removed is carried out by a laser and material removed by said laser has a width not greater than the beam width of the laser.

4,105,469

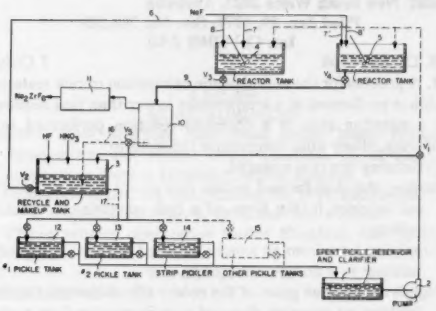
PROCESS FOR REGENERATING A PICKLE ACID BATH

Joseph Allen Megy, Corvallis, and Richard Lee Propst, Scio, both of Oreg., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Feb. 11, 1977, Ser. No. 767,993

Int. Cl.[2] B08B *3/10*

U.S. Cl. 134—3 5 Claims



1. In a process of pickling a metal selected from the group consisting of zirconium and zirconium alloys by contacting the metal with a HF-HNO_3 pickle acid, recovering spent pickle acid, regenerating the spent pickle acid, and subsequently recycling the regenerated acid for further pickling, the improvement comprising regenerating the spent pickle acid by adding thereto sodium fluoride in an amount sufficient to produce a pickle acid containing from 3–7gZr/l.

4,105,470

DYE-SENSITIZED SCHOTTKY BARRIER SOLAR CELLS

Terje A. Skotheim, Berkeley, Calif., assignor to The United States Government as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 1, 1977, Ser. No. 802,399

Int. Cl.[2] H01L *31/06*

U.S. Cl. 136—89 SJ 8 Claims

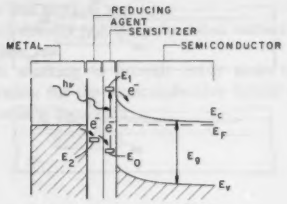
1. A solar cell comprised of:

a semiconductor formed to have two faces;

an ohmic contact on one of said faces;

a sensitizer layer on the other of said semiconductor faces, said sensitizer layer having a ground state within the bandgap of the semiconductor and a first excited state above the conduction band edge of the semiconductor;

a reducing agent layer over said sensitizer layer, said reducing agent having a ground state that is above the ground

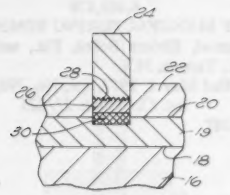


state of said sensitizer layer; and a metal layer over said reducing agent layer.

4,105,471
SOLAR CELL WITH IMPROVED PRINTED CONTACT AND METHOD OF MAKING THE SAME

John W. Yerkes, Granada Hills, and James E. Avery, Burbank, both of Calif., assignors to Arco Solar, Inc., Chatsworth, Calif.

Filed Jun. 8, 1977, Ser. No. 804,688
Int. Cl.² H01L *31/06*
U.S. Cl. 136—89 CC 7 Claims



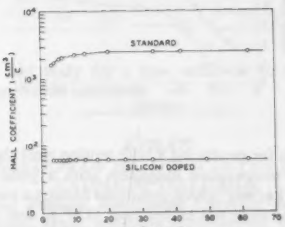
1. The method of manufacturing a solar cell comprising:
(A) providing a silicon semiconductor body having a P/N junction at a shallow depth of less than approximately 0.5 microns formed in a first surface thereof;
(B) applying a layer of metal to said first surface and coextensive therewith;
(C) printing a pattern of electrically conductive material included in a paste having a glass frit therein on said metal layer;
(D) heating said body in the presence of oxygen to a temperature of at least approximately 600° C and for a time sufficient to oxidize said metal layer and form an anti-reflective coating on said first surface except where it is covered by said contact material and to form an ohmic contact and bond between said printed electrically conductive material and said first surface without destroying said P/N junction; and
(E) cooling said body.

7. A silicon solar cell made by the method of:
(A) providing a P-type silicon semiconductor body having a P/N junction at a shallow depth of less than approximately 0.5 microns formed in a first surface thereof and an ohmic contact on the opposite surface of said body;
(B) applying a layer of metal having a thickness approximately 450 Angstroms and selected from the group consist of tantalum and niobium to said first surface and coextensive therewith;
(C) printing a pattern of electrically conductive material including a paste having a glass frit therein on said metal layer;
(D) heating said body in the presence of oxygen to a temperature of at least 600° C and for a time sufficient to oxidize said metal layer and form an anti-reflective coating on said first surface except where it is covered by said contact material and to form a layer of the silicide of said metal at the interface with said first surface to provide an ohmic contact and bond between said printed electrically conductive material and said first surface without destroying said P/N junction; and
(E) cooling said body.

4,105,472
PREPARATION OF SILICON DOPED MERCURY CADMIUM TELLURIDE

Robert A. Lancaster, Brookline, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.

Division of Ser. No. 757,270, Jan. 6, 1977, Pat. No. 4,087,293.
This application Feb. 6, 1978, Ser. No. 875,267
Int. Cl.² H01L *21/02*
U.S. Cl. 148—1.5 5 Claims



HALL COEFFICIENT VERSUS INVERSE TEMPERATURE FOR SILICON DOPED AND STANDARD SAMPLES OF MERCURY CADMIUM TELLURIDE.

1. In a method of bulk growing crystals of mercury cadmium telluride to form a semiconductor body, the improvement comprising:
the step of adding a quantity of silicon to said mercury cadmium telluride prior to formation of said body.

4,105,473
METHOD OF PROTECTING AN ALUMINUM BRAKING SURFACE

Arnold E. Anderson, Livonia, and Marvin H. Weintraub, Oak Park, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 14, 1977, Ser. No. 833,328
Int. Cl.² F16D *69/02*
U.S. Cl. 148—6 3 Claims

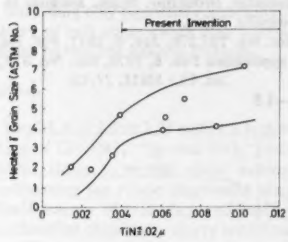
1. A method of protecting an aluminum braking surface of a brake system including a braking surface and a brake lining, and for using the system for a plurality of braking actions, which method comprises the steps of:
forming the braking surface of the braking system from aluminum;
forming the brake lining of a brake lining material which includes as a part of the composition thereof an additive selected from the group consisting of sodium fluoride and cryolite (Na_3A1F_3);
subjecting the brake system to repeated braking actions whereby said additive of the brake lining reacts with a surface layer of said aluminum braking surface to form a tenacious, wear resistant layer on said aluminum braking surface; and
further subjecting the brake system to braking actions in which said tenacious, wear resistant surface layer serves as a braking surface and as a self-healing, protective layer to protect freshly exposed aluminum as the braking surface wears over its useful life.

4,105,474

PROCESS FOR PRODUCING A HIGH TENSION STEEL SHEET PRODUCT HAVING AN EXCELLENT LOW-TEMPERATURE TOUGHNESS WITH A YIELD POINT OF 40 KG/MM² OR HIGHER

Hajime Nakasugi; Hiroaki Masui; Hiroshi Tamehiro; Tetuo Takeda, and Seiji Eiro, all of Kimitsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 12, 1977, Ser. No. 786,946
Claims priority, application Japan, Apr. 12, 1976, 51-40258
Int. Cl.² C21D 7/14
U.S. Cl. 148—12 F **4 Claims**



1. A process for producing a high tension steel sheet having excellent low-temperature toughness with a yield point not lower than 40 kg/mm² which comprises heating a steel ingot or slab to a temperature not higher than 1150° C, and rolling the steel ingot or slab thus heated with a total reduction amount not less than 50% in a temperature range not higher than 930° C and a finishing temperature not higher than 830° C,

said steel ingot or slab containing 0.01 to 0.13% C, 0.1 to 1.0% Si, 0.7 to 2.0% Mn, not more than 0.1% total Al, 0.004 to 0.03% Ti, 0.001 to 0.009% total N, 0.01 to 0.10% Nb, 0.01 to 0.15% V, 0.05 to 0.40% Mo, with the balance being unavoidable impurities and Fe, in which (Nb%) × (C%) $\leqq 5 \times 10^{-3}$ and TiN not larger than 0.02μ is not less than 0.004%.

4,105,475

EPITAXIAL METHOD OF FABRICATING SINGLE IGFET MEMORY CELL WITH BURIED STORAGE ELEMENT

Fredrick Benjamin Jenne, Los Gatos, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Division of Ser. No. 624,868, Oct. 23, 1975, Pat. No. 4,003,036. This application Oct. 1, 1976, Ser. No. 728,906
Int. Cl.² H01L 21/467, 27/04, 29/78
U.S. Cl. 148—175 **5 Claims**

1. A method for making a semiconductor memory device having an array of single IGFET memory cells comprising the steps of:

providing a substrate of semiconductor material having a preselected impurity concentration;

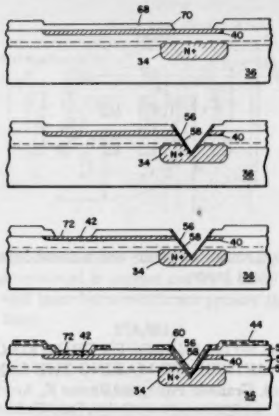
forming a plurality of spaced apart diffused first regions on the upper surface of and having the opposite polarity from said substrate;

forming an epitaxial layer of material on said substrate that covers said first regions and has the same polarity as said substrate material;

forming in said epitaxial layer a plurality of second regions of material having the same polarity as and spaced directly above said first regions while also forming conductive paths that interconnect aligned groups of said second regions to provide bit lines for said memory device; forming a recess for each said cell that extends through said second region and into said first region;

forming a gate oxide layer having a thickness of 500Å – 1000Å on the wall of said recess extending between said first and second regions; and

forming a layer of conductive material on said gate oxide layer to provide a gate means for each said cell within said



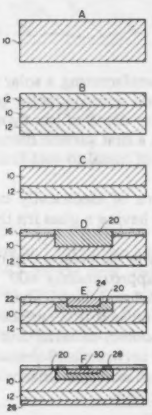
recess and extending between said cells to provide address lines for said memory device.

4,105,476

METHOD OF MANUFACTURING SEMICONDUCTORS

Fawzi J. Hamzawi, Riviera Beach, Fla., assignor to Solitron Devices, Inc., Tappan, N.Y.

Filed May 2, 1977, Ser. No. 793,190
Int. Cl.² H01L 21/225
U.S. Cl. 148—187 **1 Claim**



1. In the manufacture of a semiconductive device the steps of:

exposing a silicon wafer of P type conductivity to a diborane impurity atmosphere by passing the wafer through a furnace containing such atmosphere at a temperature of 1050° C over a 4 hour period to deposit said diborane impurity about said wafer as a glassy layer;

passing said wafer through a furnace after depositing said diborane impurity for a period of two more hours while raising its temperature to and holding it thereat 1200° C to diffuse the diborane impurity into the wafer;

cooling the wafer gradually to avoid thermal gradients between the glassy layer and the wafer;

stripping the glassy layer from one surface;

passing the wafer after the stripping through a furnace to

heat it to and hold it at 1275° C for a period of 48 hours to provide a P+ depth of approximately 4 mils in from the other surface of the wafer;

lapping the one surface;

chemo-mechanically polishing the other surface to leave a P+ surface; and

using oxide masking to provide other areas of impurity concentration for the semiconductive device and appropriate contacts therewith.

4,105,477

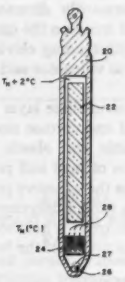
DOPING OF (Hg,Cd)Te WITH A GROUP VA ELEMENT

Eric Shanks Johnson, and Joseph Lawrence Schmit, both of Minnetonka, Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Division of Ser. No. 757,266, Jan. 6, 1977, abandoned. This application Oct. 31, 1977, Ser. No. 846,739

Int. Cl.² H01L *21/04*

U.S. Cl. 148—187 20 Claims



1. A method of adjusting the acceptor concentration in a body of mercury cadmium telluride, comprising the steps of:

contacting a body of mercury cadmium telluride with a quantity of acceptor material selected from the group consisting of phosphorus, arsenic and antimony; and

heating said body at a temperature of at least 550° C for a sufficient time to distribute said acceptor material within said body.

4,105,478

DOPING HgCdTe WITH Li

Eric S. Johnson, Minnetonka, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

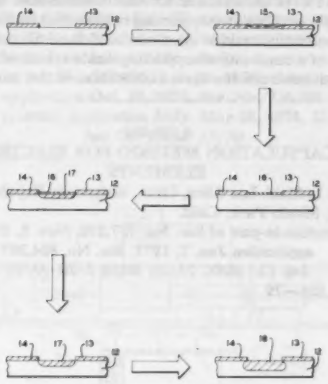
Division of Ser. No. 757,265, Jan. 6, 1977, Pat. No. 4,087,294. This application Feb. 3, 1978, Ser. No. 875,033

Int. Cl.² H01L *21/04*

U.S. Cl. 148—188 16 Claims

1. A method of adjusting the acceptor concentration in a body of mercury cadmium telluride, comprising the steps of:

contacting said body of mercury cadmium telluride with a quantity of lithium; and



heating said body for a time sufficient to distribute said lithium within said body.

4,105,479

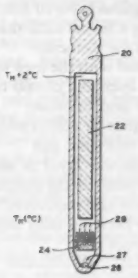
PREPARATION OF HALOGEN DOPED MERCURY CADMIUM TELLURIDE

Eric Shanks Johnson, and Joseph Lawrence Schmit, both of Minnetonka, Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Division of Ser. No. 757,271, Jan. 6, 1977, Pat. No. 4,086,106. This application Feb. 6, 1978, Ser. No. 875,266

Int. Cl.² H01L *21/04*

U.S. Cl. 148—189 18 Claims



1. A method of adjusting the donor concentration in a body of mercury cadmium telluride, comprising the steps of:

contacting a body of mercury cadmium telluride with a quantity of donor materials selected from the group consisting of bromine and iodine; and

heating said body at a temperature of at least 550° C for a sufficient time to distribute said donor material within said body.

4,105,480

FLASHLAMP COMPOSITION

Vaughn C. Sterling, East Cleveland, and Lewis J. Schupp, Chesterland, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 567,576, Apr. 14, 1975. This application May 2, 1977, Ser. No. 792,753

Int. Cl.² C06B *33/12*

U.S. Cl. 149—40 6 Claims

1. A shorting primer material for a high voltage activated

flashlamp which comprises a solid mixture containing in weight percent about 40–90% powdered combustible metal fuel, 5–15% of an oxidizer for said combustible metal fuel, 5–15% of a combustion supporting oxide which is converted to a non-conductive residue upon combustion of the mixture, and 10–20% of a combustion supporting oxide which is converted to a conductive residue upon combustion of the mixture.

4,105,481

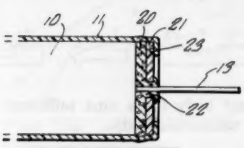
ENCAPSULATION METHOD FOR ELECTRICAL ELEMENTS

Clyde A. Lofdahl, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 737,278, Nov. 1, 1976. This application Jun. 7, 1977, Ser. No. 804,397

Int. Cl.[2] B29C *27/20;* **B32B** *5/20, 31/20*

U.S. Cl. 156—79 **16 Claims**



1. In a process for encapsulating a cylindrical electrical element having lead wires emanating therefrom comprising enveloping said element in a heat-shrinkable polymeric tubular member whereby said lead wires extend out through the open ends of said tubular member and heating said tubular member causing it to conformingly recover around said element, the improvement comprising:

(a) threading each of said outwardly extending lead wires through a separate hole in a laminated disc, said disc comprising a layer of polymeric material and a substantially copolar contiguous layer of heat foamable adhesive, said threading being effected such that the adhesive layer is disposed towards the element;

(b) inserting the said disc with the lead wires threaded therethrough within the open end of said tubular member; and

(c) applying sufficient heat to cause:

(i) the tubular member to conformingly recover around said element and said disc, and

(ii) the foamable adhesive layer of said disc to foam and seal the interface between the periphery of said disc and the inside surface of said recovered tubular member and also the interface between each hole and the lead wire passing therethrough.

4,105,482

METHOD OF VULCANIZING A PREVULCANIZED TREAD

Friedrich-Wilhelm Wapelhorst, Lauben, and Heinz-Dieter Kalkoff, Witten, both of Germany, assignors to Lieselotte Trappe, Wetter, Germany

Filed Apr. 28, 1975, Ser. No. 571,441

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1974, 2420220

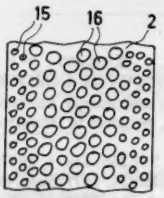
Int. Cl.[2] B29H *17/00, 17/37*

U.S. Cl. 156—96 **24 Claims**

1. A method for retreading a tire carcass having an arcuate tread engaging crown with a prevulcanized annular tread having a pattern of ribs and grooves on its exterior road enaging surface and a substantially flat interior cross sectional configuration when in the unstressed state; said method comprising:

(a) applying the tread to the crown of the carcass with an unvulcanized bonding rubber intermediate layer therebetween, the tread being elastically deformed to conform to the carcass crown, the application of the tread to the carcass being effected in such a manner that the occlusion of air between the tread and the carcass is avoided;

(b) securing a stressing belt annularly around the assembled tread and carcass, said stressing belt being an elongated endless band extending annularly around the road engaging surface of the assembled tread with its longitudinal direction running in the same direction as the tread and its width corresponding at least to that of the tread, the belt having openings to allow a surrounding fluid to pass therethrough to at least some of the road engaging surface of the tread so that the pressure of the fluid is transmitted to all of the ribs and grooves of the tread, said belt further being elastic, secured annularly around the tire and pressed thereagainst by shrinkage in its longitudinal direction under the influence of heat and moisture thereby



providing around the longitudinal direction of the tread a uniform, radially inwardly directed stress to hold the elastically deformed tread on the carcass, said belt further being capable of withstanding elevated temperatures and pressures sufficient to vulcanize said bonding rubber intermediate layer;

(c) vulcanizing the intermediate layer of bonding rubber by subjecting the tread and carcass assembly with the fluid-permeable, shrinkable and elastic stressing belt thereabout to the action of heat and pressure in an enclosed chamber whereby as the adhesive power of the intermediate layer of bonding rubber decreases during heating prior to vulcanization, the tread is held securely in position and distortion of the carcass or of the bonding rubber layer is avoided.

4,105,483

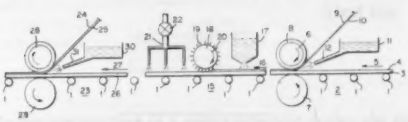
PRINTING INK TRANSFER PROCESS

Liang-Chuan Lin, Taipei, Taiwan, assignor to Globe Industries Corporation, Taipei, Taiwan

Filed Feb. 14, 1977, Ser. No. 768,453

Int. Cl.[2] B32B *31/22, 31/12, 31/20*

U.S. Cl. 156—154 **14 Claims**



1. A process for transferring printed information alone from a printed surface of a printed paper to a substrate having at least one smooth substantially non-porous surface, the printed information consisting of printing ink imprinted on the paper without any intermediate layer of material therebetween, comprising the steps of:

a. applying transparent adhesive to the printed surface to form a coating of adhesive thereon;

b. applying transparent adhesive to the smooth surface to form a coating of adhesive thereon;

c. when said coatings of adhesive are dry, applying an adhesive solvent to at least one of the coated surfaces of the printed paper and the substrate;

d. when the solvent has activated the exposed surface of the adhesive coating to which the solvent has been applied and before the entire coating to which the solvent has been applied has been penetrated by the solvent, pressing the activated surfaces together to unite the adhesive coatings and to squeeze any excess solvent from between the coatings; and

e. when the united adhesive is dry, applying a paper solvent to the paper and removing the dissolved paper thereby leaving the printed information attached to the substrate by means of said adhesive.

14. A process for transferring printed information alone, from a printed surface of a printed paper to a substrate having at least one smooth substantially non-porous suface, the printed information consisting of printing ink imprinted on the paper without any intermediate layer of material therebetween comprising the steps of:

a. applying transparent adhesive to at least said printed surface to form a coating of adhesive thereon;

b. when said adhesive is set, applying a solvent for the adhesive to at least one said surface;

c. pressing said surfaces together to unite them by means of the adhesive and to squeeze any excess solvent from between the surfaces before the entire thicknes of the adhesive has been penetrated by the solvent; and

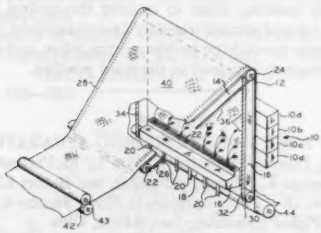
d. when the adhesive is set, applying a paper solvent to the paper and removing the dissolved paper thereby leaving the printed information attached to the substrate by means of said adhesive.

4,105,484

INFRARED APPARATUS FOR PRODUCING A FUSED FABRIC

Richard C. Newton, and Gerald A. Romanek, both of Greenville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 16, 1977, Ser. No. 797,213
Int. Cl.[2] B32B *19/02, 31/00*
U.S. Cl. 156—380 **10 Claims**



1. Apparatus comprising, in combination,

infrared heating means,

conveying means suitable for transporting a fabric adjacent to and spaced a distance from said infrared heating means, suitable for transporting the fabric so that the surfaces of the fabric are unrestricted, and suitable for grasping the edges of the fabric, and

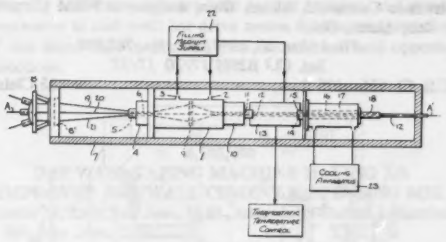
fluid-contacting means for forcing a fluid in contact with the surface of the fabric immediately opposite the surface of the fabric positioned adjacent to and spaced a distance from said infrared heating means.

4,105,485

APPARATUS FOR IMPREGNATING STRANDED WIRES DURING STRANDING THEREOF

Antonio Portinari, Sesto San Giovanni (Milan), and Piero Lavezzari, Desio (Milan), both of Italy, assignors to Industrie Pirelli Societa per Azioni, Milan, Italy

Division of Ser. No. 569,806, Apr. 21, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,004
Claims priority, application Italy, May 28, 1974, 23225 A/74
Int. Cl.[2] H01B *13/30*
U.S. Cl. 156—382 **6 Claims**



1. In apparatus for manufacturing a grouped strand for a fully-filled electric cable, said strand comprising a plurality of electrically conductive components of elongated shape stranded together with the spaces between said components filled with, and the exterior of said strand coated by, a water-impermeable and electrically insulating filling medium having a predetermined dropping point temperature, said apparatus comprising:

a chamber having an inlet opening and an outlet opening spaced from said inlet opening for circulating said medium under a pressure above atmospheric pressure and at a temperature at least 5° C above said dropping point temperature through said chamber and having an inlet die at one portion of said chamber and an outlet die at another portion of said chamber spaced from said one portion, each said die having an opening therethrough of a size for closely receiving, while permitting the passage therethrough of, all said components in abutting relation and the opening of said outlet die being aligned with the opening of said outlet die and said chamber being substantially liquid-tight except for the opening in each die, and said inlet opening and said outlet opening;

a spreading element mounted in said chamber, between said inlet die and outlet die, and extending transversely of a line between said opening of said inlet die and said opening of said outlet die and intermediate and being spaced from both said inlet die and said outlet die, said spreading element having a plurality of apertures therein spaced from each other and from said line for individually receiving said components and permitting the passage of a said component through an aperture, each of said apertures being spaced from the others of said apertures by a distance greater than the distance between said abutting components as they pass through said inlet die to cause said components to be forced apart after they leave said inlet die; so that after passage through said apertures, the entire outer surface of each component is in contact with said filling medium for impregnation thereby

means connected to said inlet opening and said outlet opening and supplying said medium to said inlet opening under pressure above atmospheric pressure and at a temperature at least 5° C above said dropping point temperature and withdrawing said medium through said outlet opening;

a tank receiving said medium at atmospheric pressure and at a temperature at least 5° C above said dropping point temperature, said tank having a first wall at said outlet die with an opening therethrough aligned with said opening in said outlet die and having a second wall spaced from said first wall with an opening therethrough aligned with

said opening in said first wall, said tank having the level of the medium therein above said opening in said first wall and said opening in said second wall;

a sizing tube for said medium extending from said second wall and aligned with opening in said second wall, said tube having an inner size substantially equal to but larger than the cross-section of said strand; and

means for cooling said tube.

4,105,486

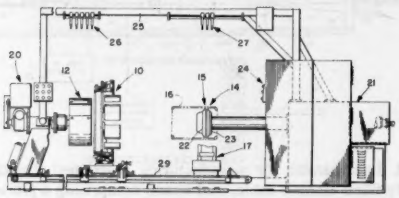
TIRE COMPONENT TRANSFER

Armindo Cantarutti, Akron, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed Mar. 30, 1977, Ser. No. 782,990

Int. Cl.[2] B29H *17/20, 17/37*

U.S. Cl. 156—405 R **15 Claims**



1. A tire component transfer comprising a set of circular sectors each having the same radius of curvature, the radially inner surface of said set of circular sectors combining to form one circular support surface made up in circumferential segments by said circular sectors, each sector including a radially extending stem, support means mounting said stems for movement radially to open and close said sectors, and means connecting said support means to the same side of each stem with fasteners projecting from the opposite side of each stem whereby said set may readily be removed and replaced by another set of sectors each having another same radius of curvature, and wherein said support means includes parallelogram link means connected to the same side of each stem.

4,105,487

PROCESS OF AND AN APPARATUS FOR PRODUCING GREEN TIRES

Masayoshi Suzuki, Higashiyamato; Tatuo Oojimi, Kodaira; Toshinori Yabe, Kodaira, and Shoji Takahashi, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 22, 1976, Ser. No. 753,496

Claims priority, application Japan, Dec. 27, 1975, 50-157534; Dec. 29, 1975, 50-157768

Int. Cl.[2] B29H *17/14*

U.S. Cl. 156—405 R **9 Claims**

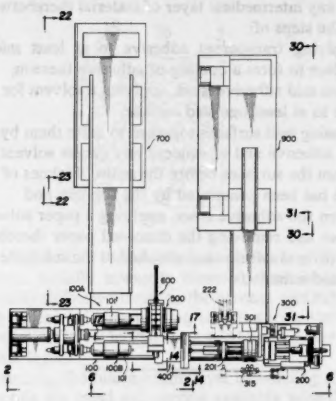
1. An apparatus for producing green tires, comprising in combination:

a tire band building mechanism including a revolvable member revolvable around it own axis to be indexed at first and second rotation positions, a pair of collapsible tire band building drums mounted on said revolvable member in spaced apart and parallel relation with each other to assume first and second station when said revolvable member is revolved and indexed at the respective first and second rotation positions, each of said tire band building drums being rotatable around its own axis, a revolving means for intermittently revolving and indexing said revolvable member into the first and second stations, and a pair of tire band building drum rotating means for rotating said tire band building drums;

a belt building mechanism including a collapsible belt building drum disposed in coaxial and spaced apart relation with said tire band building drum occupying said second station and rotatable around its own axis, and a belt building drum rotating means for rotating said belt building drum;

a tire building drum mechanism including a tire building drum disposed between and in coaxial relation with said tire band building drum occupying said second station and said belt building drum to be deformable between a cylindrical form and a toroidal form, and a tire building drum rotating means for rotating said tire building drum; and

a transfer ring mechanism including a movable base structure movable to assume first, second and third positions, first and second transferring arrangements mounted on said movable base structure in spaced relation with each other along the axes of said tire band building drum, said belt building drum and said tire building drum with a distance between the mid-circumferential planes of said



transferring arrangements substantially equal to a distance between the mid-circumferential planes of said tire building drum and said belt building drum, said first transferring arrangement surrounding said tire band building drum when said movable base structure is moved to the first position, said first transferring arrangement surrounding said tire building drum to transfer a green case thereon to said tire building drum and said second transferring arrangement surrounding said belt building drum to receive and endless belt from said belt building drum when said movable base structure is moved to said second position, said second transferring arrangement surrounding said tire building drum to transfer the endless belt, received on said second transferring arrangement, onto the green case on said tire building drum when said movable base structure is moved to the third position.

4,105,488

RAW EDGE V-BELT BUILDING APPARATUS

Richard H. Hayes, Tallmadge; Lellan L. McFarland, Wadsworth; George L. Schrum, Tallmadge, and Robert S. Vanderzee, Akron, all of Ohio, assignors to Akron Standard, Division of Eagle-Picher Industries, Inc., Akron, Ohio

Filed Feb. 3, 1976, Ser. No. 654,845

Int. Cl.[2] B29H *7/22*

U.S. Cl. 156—425 **4 Claims**

2. Apparatus for building a raw edge V-belt carcass comprising,

a drum for receiving plies of material and wrapping them about said drum to form a cylindrical carcass,

means for rotating said drum,

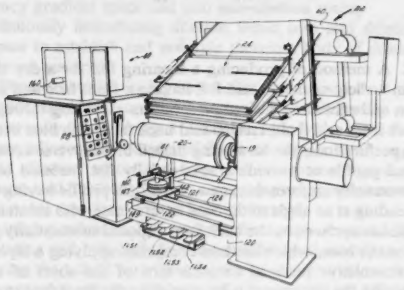
a cord let-off mechanism for applying a cord in a helix around said carcass,

said cord let-off mechanism including a let-off roll for said cord, a variable speed direct current motor driving said let-off roll,

a resolver having a movable element located in the path of cord for said let-off mechanism to said winding head and engageable with said cord to detect tension variations in said cord, said resolver supplying a signal to said motor which varies with the tension on said cord and causes the speed of said motor to vary with the tension on said cord,

a series of idler pulleys over which said cord passes, the movable element of said resolver being an arm pivoted at one end and carrying a movable idler pulley at the other end, said cord passing around said movable idler pulley to form a loop,

means biasing said arm to swing in a direction opposite to that which the tension on the cord causes it to swing,



said resolver detecting the position of said arm and signaling said motor to supply cord at a rate which will tend to maintain said arm at a preselected operative position,

said idler pulley having sequentially

a. a first range of positions in which said cord supplying means is caused to operate in a reverse direction to withdraw cord,

b. a second position in which said supplying means is inoperative,

c. a third range of positions in which said supplying means supplies cord at a rate dependent on the position of said idler pulley within said range, and

d. a fourth range of positions in which said drum is caused to rotate more slowly.

4,105,489

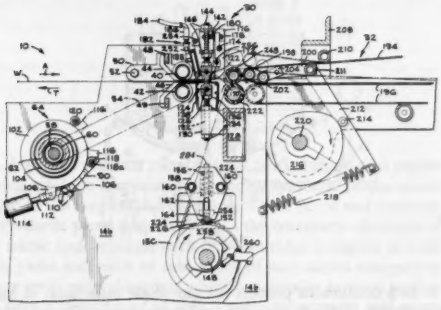
APPARATUS FOR MAKING BOTTOM SEAL THERMOPLASTIC BAGS

Ronald L. Lotto, Bonduel, Wis., assignor to FMC Corporation, San Jose, Calif.

Continuation of Ser. No. 198,282, Nov. 12, 1971, abandoned. This application Jul. 25, 1973, Ser. No. 382,607

Int. Cl.[2] B32B *31/00*; B30B *15/34*

U.S. Cl. 156—510 **6 Claims**



1. In a bag machine of the type for making bags from an elongate web of thermoplastic material including intermittently operable web draw rolls for feeding the leading portion of the web a distance equal to the length of a bag and transversely extending weld bars associated with a cutter for severing and welding the web at intervals equal to the feed length, said machine comprising means for intermittently driving said draw rolls including an input shaft which is continually rotated in opposite directions, drive means for reciprocating one of said weld bars relative to the other to effect transverse welding of the web portion located between said weld bars, said weld bars being operable to engage and weld the web when said input shaft is rotating in one of said opposite directions whereby said draw rolls are held against rotation, and means responsive to said weld bar drive means for initiating rotation of said draw rolls in one and then the other of said opposite directions.

4,105,490

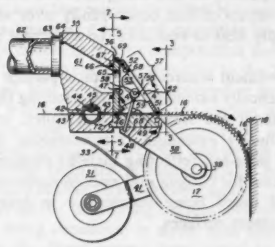
DRY WALL TAPING MACHINE HAVING AN IMPROVED DRY WALL CEMENT DISPENSING BOX

Harold M. Lass, San Jose, Calif., assignor to Corban Industries, Inc., San Jose, Calif.

Filed Nov. 8, 1976, Ser. No. 739,517

Int. Cl.[2] B32B *31/00*; B44C *7/00*; B05C *3/02*

U.S. Cl. 156—526 **21 Claims**



1. In a dry wall taping machine:

main body means to be grasped by the operator for applying dry wall tape from a tape supply over a seam between adjacent sections of dry wall;

said main body means having a tape applicator head portion to be disposed adjacent the seam to be taped for applying dry wall cement to the tape and for applying the cement laden tape to the wall and for severing the tape upon completion of the taping of a seam;

means for feeding tape from a supply thereof through said applicator head portion onto the seam to be taped;

said tape applicator head portion including a dry wall cement dispensing means for dispensing dry wall cement onto the face of the tape which is to face the wall being taped;

said dry wall cement dispensing means including chamber means for containing dry wall cement therein, conduit means for feeding fluid dry wall cement into said chamber means, inlet and outlet tape port means in said chamber means for passage of the tape through said chamber means for dispensing dry wall cement onto the tape, and sealing lip means for pressing against the tape and for sealing said tape inlet port means against flow of the dry wall cement outwardly of said chamber through said tape inlet port means in the up-tape direction while permitting passage of the tape into said chamber means through said sealing lip means; and

quick disconnect means for quickly disconnecting said dry wall cement dispensing means from said head portion of said dry wall taping machine.

4,105,491

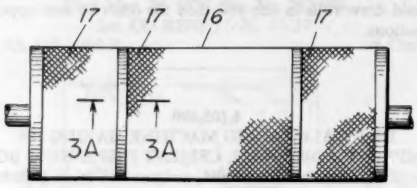
PROCESS AND APPARATUS FOR THE MANUFACTURE OF EMBOSSED FILM LAMINATIONS

Donald A. Haase, Penfield, and Robert E. Reed, Canandaigua, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 551,799, Feb. 21, 1975, abandoned, which is a division of Ser. No. 13,171, Feb. 20, 1970, abandoned, which is a continuation of Ser. No. 580,302, Sep. 19, 1966, abandoned. This application Mar. 9, 1977, Ser. No. 776,082

Int. Cl.[2] B32B *31/20*

U.S. Cl. 156—553 1 Claim



1. In an apparatus for preparing a two layer embossed thermoplastic laminate comprising a roller having a raised pattern surface, said pattern surface being infra-red absorbent, means to pass two layers of film concurrently over said roller and means to apply heat to said infra-red absorbent raised pattern surface:

the improvement wherein said raised pattern surface comprises helically extending and intersecting circumferential bands about the surface of said roller, interrupted by longitudinally extending circumferential bands having smooth infra-red reflecting metallic surfaces and associated means for cooling said smooth surfaces, said smooth surfaced bands being coextensive in height with said raised pattern surfaces.

4,105,492

TREATED GLASS FIBERS

Kevin M. Foley, Maumee; Anil K. Rastogi, and Joseph P. Rynd, both of Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 680,325, Jul. 26, 1976, abandoned, which is a continuation of Ser. No. 461,326, Apr. 16, 1974, abandoned. This application Aug. 29, 1977, Ser. No. 828,377

Int. Cl.[2] C03C *25/06;* B32B *13/02*

U.S. Cl. 156—629 7 Claims

1. A method of preparing a cementitious matrix reinforced with glass fibers having on their surfaces a uniform coating at least monomolecular in thickness of zirconium dioxide comprising the steps of applying an aqueous solution of ammonium zirconyl carbonate to the surfaces of glass fibers, keeping the fibers wetted under etching conditions for a period of time to effect ion exchange with water extractable ions in the surface of the glass, evaporating the water from the resulting coating on the surfaces of the glass fibers, and incorporating the resulting coated glass fibers into a cementitious matrix.

4,105,493

PRODUCTION OF SHAVING FOIL

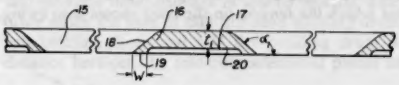
Jean-Daniel Chauvy, Chaumont, Switzerland, assignor to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 699,040, Jun. 23, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,968

Claims priority, application United Kingdom, Jul. 5, 1975, 28426/75

Int. Cl.[2] C23F *1/02*

U.S. Cl. 156—644 8 Claims



1. A method of producing a shearing foil for a dry shaver from a sheet of metal, said foil having a front face and a back face, and exhibiting desired perforations extending through the sheet from said front face to said back face with bars between the perforations, the bars being dished in transverse cross-sectional profile to provide a substantially flat recessed base of substantially uniform thickness, the dished profile having edges extending at an angle to the base to terminate with substantially coplanar surfaces on the back face disposed substantially parallel to the base, which method comprises applying a layer of a photosensitive material to each face of the sheet of metal, exposing the photosensitive material on the front face to radiation through a mask having a hole pattern corresponding to the desired perforations of the shaving foil, exposing the photosensitive material on the back face to radiation through a mask having a pattern corresponding to the recessed base of the dished profile, developing the exposed photosensitive material on said faces in order to generate a respective pattern of unprotected regions on each face of the metal sheet, etching said unprotected regions of the front face, and of the back face, removing the photosensitive layer from only the front face, and carrying out a further etching of the front face until a predetermined quantity of metal is removed providing the bars with smoothly rounded ridges and edges extending at an obtuse angle to the base.

4,105,494

PROCESS OF GAS-PHASE BLEACHING HIGH CONSISTENCY FINELY DISINTEGRATED PULP

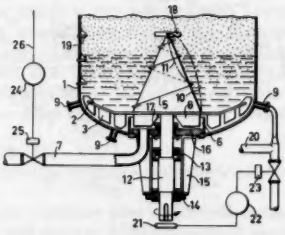
Bengt Edvard Pettersson, Sundsvall, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

Division of Ser. No. 426,437, Dec. 20, 1973. This application Apr. 29, 1976, Ser. No. 681,483

Claims priority, application Sweden, Jan. 5, 1973, 73001471

Int. Cl.[2] D21C *9/10, 7/12, 3/24, 7/00*

U.S. Cl. 162—19 3 Claims



1. In a continuous process for gas-phase bleaching, at high consistency, of finely disintegrated gas-pervious fibrous material, which comprises

establishing and maintaining a generally vertical column of fibrous material of a high consistency of from about 18 to

about 40%, in an elongated generally vertical chamber, said column of high consistency being spaced from the upper and lower extremities of the chamber wherein there is a gas space with an atmosphere containing gaseous bleaching agent above, and a dilution space beneath, between said column and said dilution space there being a consistency gradient space;

continuously showering fluffed finely disintegrated fibrous material into the chamber at the upper end thereof through said atmosphere containing gaseous bleaching agent and onto the top of said column while simultaneously maintaining substantially constant the height of said column by continuously removing fibrous material from the lower end of said column through said consistency gradient space and into said dilution space;

continuously introducing dilution liquid into said dilution space to establish and maintain therein a body of diluted fibrous material;

the fibrous material during its continuous removal from the lower end of said column being guided downwardly and outwardly by rotating a rotatable hub body extending from adjacent the bottom of the tower upwardly through said dilution space and into said consistency gradient space, said hub body having a progressively greater cross-sectional area from top to bottom thereof;

maintaining substantially constant the torque required for rotating said hub body by substantially continuously measuring the actual variations from a predetermined normal torque and varying the rate of introduction of dilution liquid inversely with variation in said torque, thereby maintaining substantially constant the consistency of the diluted fibrous material as withdrawn from the bottom of the tower; and

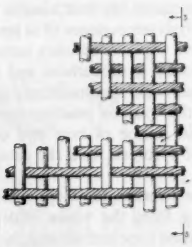
continuously measuring the height of the column, and varying the rate of withdrawal of diluted fibrous material from the bottom of the tower so as to maintain substantially constant the height of said column.

4,105,495

STRETCH-RESISTANT PAPERMAKERS BELTS HAVING NON-POROUS SYNTHETIC CABLES

Karnire S. Pai, Greeneville, Tenn., assignor to Huyck Corporation, Wake Forest, N.C.

Filed Dec. 8, 1975, Ser. No. 638,391
Int. Cl.[2] D21F *1/10*; D03D *15/00*
U.S. Cl. 162—348 **5 Claims**



1. A stretch resistant papermakers' fabric for use on a papermaking machine comprising nonporous synthetic cables which extend in the longitudinal direction of said fabric and comprising synthetic yarns which extend in the transverse direction of said fabric and, wherein each of said cables comprise at least three yarns and each of said yarns of said cables comprising two or more monofilaments which are circular in cross section and have a diameter of at least 3 mils and wherein said yarns which comprise said cables comprise monofilaments of polyester and include ultra high modulus multifilaments.

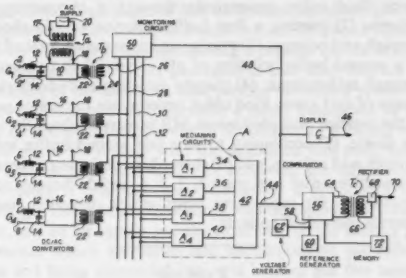
3. A fabric as recited in claim 1 wherein said yarns of said cables include multifilament poly (para-phenylene terephthalamide), and said cables are resin coated.

4,105,496

METHOD AND DEVICE FOR ELECTRONIC CONTROL WITH POSITIVE SAFETY

Jean-Paul Therond, Versailles, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 5, 1975, Ser. No. 638,207
Claims priority, application France, Dec. 11, 1974, 74 40769
Int. Cl.[2] G21C *17/00*; G06G *7/14*
U.S. Cl. 176—19 R **6 Claims**



1. An electronic device for positive safety control which serves to carry out a method of control of a protection system, in particular for a nuclear reactor, in which N measurements of either one or a number of physical quantities are taken and processed by N matching and/or computation units, wherein the median of the N signals corresponding to the N measurements is selected, said signals being obtained at the output of said units, and wherein the value of the median is compared with a reference value so that the comparison initiates the desired protection action, and wherein said device comprises:

N inputs derived from the N matching and computation devices which deliver direct-current signals,

N direct-current to alternating-current converters, each converter being connected in series with each input for converting the direct-current input signal to a periodic signal having a frequency *f* and an amplitude which is proportional to the direct-current input quantity,

a supply A' which delivers a periodic signal having a frequency f into the N converters by means of an isolation transformer,

an alternating current median-determination circuit A containing means for selecting the median of the amplitudes of the periodic signals delivered by the converters, and

an alternating current comparator for comparing said value Vm of the amplitude of the median with a predetermined direct-current reference value Vr and delivering by means of an isolation transformer a logical signal +1 when Vm − Vr>0, and 0 when Vm − Vr<0, each of the elements of the device being designed for positive safety.

4,105,497

Patent Not Issued For This Number

4,105,498

ANEROBIC SPECIMEN TRANSPORT SYSTEM

William Hertl, and William S. Ramsey, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 19, 1977, Ser. No. 798,659
Int. Cl.[2] C12K *1/08*
U.S. Cl. 195—59 **10 Claims**

1. A method of maintaining a specimen of an anaerobic microbe under conditions which are substantially anaerobic and which enhance the anaerobicity of the specimen, the method comprising immersing the specimen in a water-immiscible, inert, substantially non-nutritive, sterile, deoxygenated oil-like fluid having an oxygen activity coefficient less than that of water.

4,105,499
HEART ATTACK SCREENING METHOD, APPARATUS AND KIT FOR SAME

John Y. Kiyasu, 94 Meadow St., Garden City, N.Y. 11530

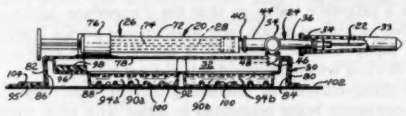
Filed Oct. 6, 1976, Ser. No. 730,102
Int. Cl.[2] G01N *31/08*
U.S. Cl. 195—103.5 R 9 Claims

1. A rapid laboratory test method for detection of heart attacks in human patients which comprises the steps of (1) passing a sample of 1.5 ml. of patient blood serum containing a green food color concentrate through a chromatographic column, (2) passing a first buffer solution of pH about 7.9 through said column, (3) passing an approximate total of 3.0 ml of a second buffer solution of pH about 6.9 in two portions through said column, (4) thereby isolating and identifying by means of said green food color concentrate the major portion of the creatine phosphokinease-MB isoenzyme from the resulting eluate, (5) continuing to pass said second buffer solution through said column, and (6) thereafter continuing to repeat, in consecutive order said steps 1, 2, 3, 4, and 5, thereby reusing the column for subsequent heart attack detection tests for separate individual patients.

4,105,500
DIAGNOSTIC DEVICE FOR A LIQUID SAMPLE AND METHOD

Gary Libman, Des Plaines, and Frank K. Villari, Oak Park, both of Ill., assignors to The Kendall Company, Boston, Mass.

Division of Ser. No. 634,110, Nov. 21, 1975, Pat. No. 4,040,909, and Ser. No. 495,978, Aug. 29, 1974. This application Mar. 4, 1977, Ser. No. 774,358
Int. Cl.[2] C12K *1/04*
U.S. Cl. 195—103.5 M 2 Claims



1. A method of preparing a sample for diagnosis, comprising the steps of:

pumping a predetermined amount of sterile liquid through a swab to a sample site while the swab is located at the site;

mixing the liquid with the sample by the swab at the site for suspension of the sample in the liquid; and

aspirating the suspended sample from the sample site through the swab while the swab is located at the site after said mixing step and pumping the withdrawn sample to a culture medium without passage through the swab for inoculation of the medium.

4,105,501
METHOD FOR PRODUCING METALLURGICAL COKE

Gyoichi Suzuki, Tokyo; Mitsutoshi Miura, Yokohama; Takashi Miyazu; Taro Matsushita, both of Tokyo, and Yasuo Okuyama, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 8, 1976, Ser. No. 730,975
Claims priority, application Japan, Oct. 23, 1975, 50/126869
Int. Cl.[2] C10B *53/04, 53/00, 47/10*
U.S. Cl. 201—6 8 Claims

1. A method for producing a high-strength metallurgical formed coke in a slight mutual agglomeration, which comprises:

forming green briquettes serving as an inner core material, said green briquettes comprising blended raw material coal fines having a maximum fluidity of up to 20 d.d.p.m.;

covering said green briquettes with an outer envelope material to a thickness of from 0.5 to 10 mm, said outer envelope material consisting essentially of coal fines having a maximum fluidity of at least 30 d.d.p.m. and an A.P. index of at least 70%;

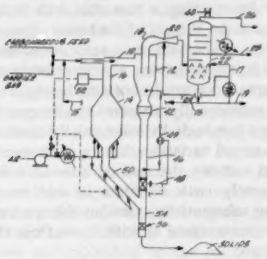
charging the resulting green composite briquettes into a horizontal coke oven battery; and

carbonizing said green composite briquettes in said battery.

4,105,502
SIMPLIFIED LIQUEFACTION PYROLYSIS PROCESS AND APPARATUS THEREFOR

Charles K. Choi, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jun. 25, 1976, Ser. No. 700,009
Int. Cl.[2] C10B *49/16, 55/08;* C10G *1/00*
U.S. Cl. 201—12 19 Claims



1. A process for the pyrolysis of carbonaceous materials which comprises:

(a) introducing, at a high velocity, to the tangential inlet of a cyclone reaction-separation zone having a vapor outlet at one end and a solids outlet at the opposed end, a stream of carbonaceous material to be pyrolyzed with a particulate solid source of heat, at a temperature above the pyrolysis temperature, contained in a carrier gas essentially free of oxygen to form a high velocity mixture of the carbonaceous material and particulate solid source of heat and pyrolyzing the carbonaceous material in the mixture by heat transfer from the particulate solid source of heat to carbonaceous material, the best transfer being sufficent to achieve a pyrolysis temperature of at least about 600° F to yield a pyrolytic vapor containing normally condensible and noncondensible hydrocarbons and a carbon containing solid residue while simultaneously centrifugally separating within the cyclone reaction-separation zone, the particulate solid source of heat and carbon containing solid residue of pyrolysis from the carrier gas and pyrolytic vapor;

(b) removing the centrifugally separated carrier gas and pyrolytic vapor from the vapor outlet of the cyclone reaction-separation zone and cooling the separated carrier gas and pyrolytic vapors to condense hydrocarbons therefrom;

(c) removing a mixture of the particulate solid source of heat and the carbon containing solid residue of pyrolysis from the solids outlet;

(d) passing at least a portion of the mixture of particulate solid source of heat and carbon containing solid residue of pyrolysis to a combustion zone to combust carbon therein in the presence of source of oxygen to form the particulate solid source of heat at a temperature required for feed to the cyclone reaction-separation zone, and the carrier gas essentially free of oxygen for feed to the cyclone reactor-separator.

4,105,503

METHOD AND APPARATUS FOR EMISSION CONTROL OF BY-PRODUCT COKE OVENS

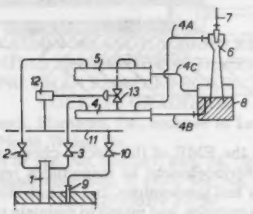
John McNicol Bruce, Chesterfield, England, assignor to British Steel Corporation (Chemicals) Limited, Great Britain

Filed Jul. 29, 1976, Ser. No. 709,722

Claims priority, application United Kingdom, Aug. 8, 1975, 33138/75

Int. Cl.[2] C10B 27/04

U.S. Cl. 201—40 11 Claims



1. A method for controlling emissions from a coke oven during the charging of the oven wherein a hydraulic main is connected to the head of the coke oven during coking, comprising disconnecting the hydraulic main from the oven prior to charging the oven and connecting the head of the oven to a fluid energized venturi ejector to draw a vacuum at the head of the oven and withdraw emissions therefrom, maintaining the supply of energizing fluid to the ejector substantially constant, sensing the degree of vacuum at the head of the oven during charging and introducing gases from a source of gases under higher pressure into the withdrawn emissions in response to an increase in the level of sensed vacuum above a predetermined level to thereby gas load the ejector and decrease the degree of vacuum drawn at the head of the oven being charged.

4,105,504

APPARATUS FOR PRODUCING FORM COKE

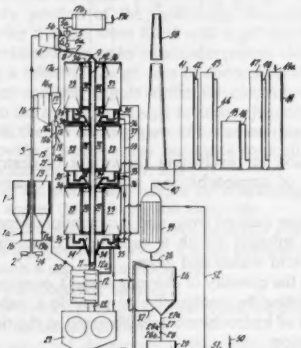
Kurt Lorenz, Hattingen, Germany, assignor to Firma Carl Still, Germany

Continuation of Ser. No. 667,153, Mar. 15, 1976, abandoned. This application Mar. 7, 1977, Ser. No. 775,200

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1974, 2439014

Int. Cl.[2] C10B 45/02

U.S. Cl. 202—91 4 Claims



1. A device for producing formed coke, comprising a vertically elongated shaft furnace, heating gas flue means defined around said shaft furnace along its height for directing heating gases into contact with the exterior of said shaft furnace, inlet means adjacent the top of said furnace, fine coal supply means connected to said inlet means for feeding fine coal through said inlet means into said furnace at a rate to effect the free fall of said fine coal therein and into the bottom of said shaft furnace, said fine coal being gasified by heat radiated through the wall of said shaft furnace from said heating gas flue means, outlet means adjacent the bottom of said shaft furnace for the discharge of the degasification fine coal, decomposition gas offtake means connected into said shaft furnace at spaced vertical locations along its height and having a passage for the offtake of the degasification gases generated in said shaft furnace by the heating of the fine coal, said passage extending upwardly and away from said shaft furnace, a mixer connected to the outlet of said shaft furnace, means for delivering a caking coal to said mixer for mixing with the degasified fine coal, and a press connected to said mixer for receiving the mixture and compressing it into individual briquettes, a portion of said heating gas flue means surrounding said degasification offtake means, and an air supply passage exteriorly of the heating gas flue means which surrounds said decomposition gas offtake means and being connected into said heating gas flue means, the connection between said air supply means to said heating gas flue means which surrounds said decomposition gas offtake means includes a plurality of nozzles directed into said heating gas flue means and a slide brick cover associated with said nozzles for varying the opening size thereof, and means for conducting degasification gases from said mixer to said degasification offtake means.

4,105,505

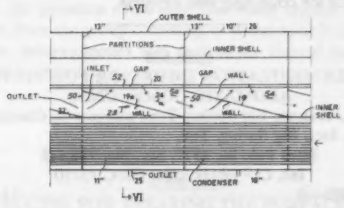
FLASH EVAPORATORS

Risto Saari, Harjula, 02440 Luoma, Finland

Filed Jun. 25, 1976, Ser. No. 699,936

Int. Cl.[2] B01D 1/26, 3/06

U.S. Cl. 202—173 10 Claims



1. In an evaporator, elongated, liquid-conveying shell means having a substantially horizontal attitude and having a hollow interior for conveying a liquid in a given direction along said hollow interior of said shell means, a plurality of transverse partition means distributed longitudinally along said shell means and fixed to and extending transversely across said shell means for dividing the latter into a plurality of evaporator stages arranged one after the other in said direction in which liquid is conveyed by said shell means in the hollow interior thereof, each of said partition means being formed with an opening situated at the interior of said shell means and each opening defining an outlet for one stage and an inlet for the next stage, so that each pair of successive partition means define between themselves an evaporator stage having an inlet at an upstream partition means and an outlet at a downstream partition means, and wall means situated in each evaporator stage extending between the upstream and downstream partition means thereof, said wall means having in each evaporator stage a pair of wall portions which are spaced from each other and define between themselves an elongated narrow gap the length of which is substantially greater than the width of said shell means with said gap defining an orifice through which liquid is compelled to flow while travelling from the inlet to

the outlet of each stage, said wall means defining with said shell means from said inlet to said gap in each stage an upstream liquid flow path through which liquid is compelled to flow from said inlet to said gap and said wall means providing for said upstream flow path a cross section which decreases as the liquid flows along said upstream flow path in each stage, and said wall means defining between said gap and said outlet of each stage a downstream flow path extending from said gap to said outlet of each stage, and said wall means providing for said downstream flow path in each stage a cross section which increases as the liquid flows along said downstream flow path in each stage from said gap to said outlet thereof, each of said evaporator stages having in its interior a space communicating with the downstream flow path for receiving a vapor in each stage downstream of said gap, condenser means at each evaporator stage communicating with said space thereof for condensing said vapor, and collector means situated beneath said condenser means for collecting distillate resulting from condensation of said vapor by said condenser means, said condenser means being situated at an elevation lower than an upper free surface of liquid flowing along said downstream flow path in each stage, said shell means having an elongated open top extending longitudinally of said shell means, with said shell means otherwise being closed and forming an inner shell means of the evaporator, and said evaporator having an outer shell means surrounding and spaced from said inner shell means and defining therewith said space which communicates through said open top of said inner shell means with liquid at each downstream flow path, said condenser means being situated in said outer shell means beneath said inner shell means, so that vapor flows from said inner shell means through said open top thereof downwardly around opposite sides of said inner shell means along opposed inner side surface regions of said outer shell means to reach said condenser means at opposite sides thereof, while due to centrifugal force droplets of liquid entrained in said vapor will deposit themselves against said inner surface regions of said outer shell means, and a pair of troughs respectively situated along said inner surface regions of said outer shell means while being spaced from said inner shell means and situated at an elevation lower than said open top thereof for collecting said droplets.

4,105,506

POLYMERIZATION INHIBITOR FOR VINYL AROMATIC COMPOUNDS

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Feb. 24, 1977, Ser. No. 771,438
Int. Cl.² B01D 3/34; C07C 15/10
U.S. Cl. 203—9 **11 Claims**

1. A process for inhibiting the polymerization of a readily polymerizable vinyl aromatic compound at elevated temperatures, which comprises subjecting said compound to said elevated temperatures in the presence of a polymerization inhibitor comprising 2,6-dinitro-p-cresol.

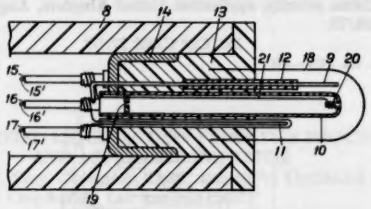
4,105,507

METHOD AND SYSTEM FOR INSTANTANEOUSLY DETERMINING THE OXYGEN ACTIVITY IN MOLTEN METALS

Otto VonKrusenstierna; Anders Persson, and Marja Widell, all of Vasteras, Sweden, assignors to Asea Aktiebolag, Vasteras, Sweden

Filed Aug. 12, 1971, Ser. No. 171,128
Claims priority, application Sweden, Aug. 27, 1970, 11627/70
Int. Cl.² G01N 27/46
U.S. Cl. 204—1 T **4 Claims**

1. A system for instantaneously determining the oxygen activity in molten metals in an electrically heated furnace where the potential of the melt usually deviates from earth potential comprising a measuring probe (1) having an electrochemical voltage-producing cell (9,10) disposed in the electrically heated furnace for contacting the melt, a thermoelement (11) and contact devices (15,16,17), a measuring lance (2) carrying the probe, a preamplifier (3) mounted on the lance, the lance having corresponding contact devices and connections for transferring values from the measuring probe to the preamplifier, a calculating unit (4) connected to the preamplifier to convert the EMF of the electro-chemical cell and the EMF of the thermoelement to magnitudes representing the oxygen activity and temperature, and an indicating instrument (5) for these magnitudes, and means to maintain the potential of the melt as the zero potential in the system.

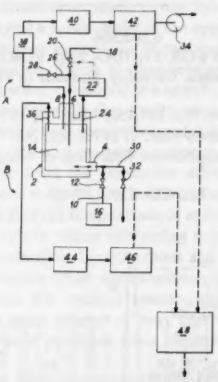


4,105,508

METHOD AND DEVICE FOR ANALYSIS OF A MIXTURE OF HYDROCHLORIC ACID AND ORGANOCHLORINE COMPOUNDS CONTAINED IN GASES DERIVED IN PARTICULAR FROM THE INCINERATION OF ORGANOCHLORINE COMPOUNDS

Jean Arod, Pierrevert; Michèle Gauthier, Aix en Provence, and Roger Platzer, Chatillon, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 24, 1977, Ser. No. 780,717
Claims priority, application France, Apr. 2, 1976, 76 09625
Int. Cl.² G01N 27/42, 31/12
U.S. Cl. 204—1 T **33 Claims**



1. A method for evaluating the extent of destruction by incineration of organochlorine compounds comprising the steps of:

passing gases derived from said incineration through a first alkaline solution which is capable of dissolving hydrochloric acid within said gases;

measuring the quantity of chloride ions, Q, contained in said first solution by coulometry to provide a value for the quantity of hydrochloric acid liberated at the time of said incineration;

absorbing the hydrochloric acid and the chlorine which are present in said incineration derived gases after they have passed through said first solution;

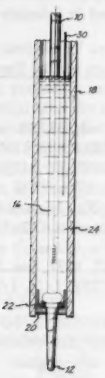
initiating combustion of the remaining gases subsequent to said absorption of the hydrochloric acid and the chlorine

therefrom in order to burn the entire quantity of organochlorine compounds contained in said remaining gases;
passing the gases produced by combustion of the remaining gases through a second solution which is capable of dissolving the hydrochloric acid liberated by the organochlorine compounds at the time of said combustion of remaining gases;
measuring the quantity of chloride ions, *q*, contained in said second solution by coulometry;
calculating the ratio *q*/Q.

4,105,509
COMBINATION MEASURING AND REFERENCE POTENTIAL ELECTRODE AND METHOD OF MEASURING PH IN SAMPLES SUBJECT TO LARGE VOLTAGE GRADIENTS

Philip R. Jungck, Horsham, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Continuation of Ser. No. 554,287, Feb. 28, 1975, abandoned. This application Sep. 7, 1977, Ser. No. 831,216
Int. Cl.² G01N *27/30*
U.S. Cl. 204—1 T **12 Claims**



2. A method for measuring with a pH measuring instrument the pH of a sample having large voltage gradients which comprises the steps of:
immersing in said sample a combination pH electrode having;
a measuring electrode with a body portion closed off at one end with a pH sensing glass, and
a reference electrode whose body portion surrounds the body portion of the measuring electrode forming a cavity therebetween filled with a gel electrolyte which is retained therein by an annular porous element providing a relatively large area of contact between said element and said sample so that the electrolyte can diffuse into the sample forming a reference junction concentric with the pH sensing glass of the measuring electrode to provide a uniform low resistance over all segments of the reference junction; and
detecting the pH of the sample by connecting said instrument across the combination electrode.

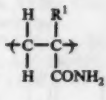
3. A combination potentiometric electrode comprising;
a measuring electrode having a body portion closed at one end with a sensing member; and
a reference electrode having,
a body portion positioned to surround the body portion of said measuring electrode,
a saturated gel electrolyte in the cavity formed between the measuring and reference electrodes, and
an annular element of substantially uniform porous material positioned between the body portions of said measuring and reference electrodes to close said cavity and provide a large area exposed for diffusion of said electrolyte into a sample to thereby form a reference junction.

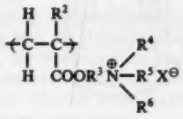
4,105,510
PROCESS FOR REMOVING WATER FROM WATER SOLUBLE POLYMER

Atsuo Tago; Ryoichi Yamanaka, and Susumu Matsumoto, all of Kitakyushu, Japan, assignors to Kyoritsu Yuki Co., Ltd. and Mitsubishi Chemical Industries Ltd., both of Tokyo, Japan

Filed Nov. 24, 1976, Ser. No. 744,817
Claims priority, application Japan, Nov. 26, 1975, 50-141267
Int. Cl.² C07B *5/00*
U.S. Cl. 203—14 **12 Claims**

1. A process for removing water and producing a dry polymer from an aqueous gel of a high molecular weight water soluble polymer having, as major components, repeating units shown in formulae (1) and/or (2)


(1)


(2)

wherein R^1 and R^2 denote hydrogen or methyl group, R^3 denotes an alkylene group having 1–3 carbon atoms, R^4, R^5 and R^6 denote the same or different lower alkyl group having 1–3 carbon atoms or benzyl group, and $X^{\ominus}$ denotes an anion; which comprises removing water from the aqueous gel of said polymer in the presence of at least one water soluble substance selected from the group consisting of water soluble polyhydric phenols, benzoquinones and derivatives thereof until a dry polymer is obtained.

4,105,511
PROCESS FOR TREATING THE SURFACE OF ALUMINUM OR ALUMINUM ALLOY

Norio Nikaido; Shinji Shirai; Mototaka Iihashi; Sueo Umemoto, and Kisaku Suzuki, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Continuation-in-part of Ser. No. 646,760, Jun. 6, 1976, abandoned, which is a continuation of Ser. No. 482,663, Jun. 24, 1974, abandoned. This application Jun. 13, 1977, Ser. No. 806,061
Claims priority, application United Kingdom, Jul. 4, 1973, 75989/73
Int. Cl.² C25D *11/06*
U.S. Cl. 204—38 A **11 Claims**

1. A process for treating the surface of aluminum or aluminum alloy comprising the steps of:
(i) contacting aluminum or aluminum alloy with hot water or steam to form an aluminum oxide layer thereon, and
(ii) conducting electrolysis using the resulting aluminum or aluminum alloy as an anode by applying direct current in an aqueous solution containing no free acid consisting essentially of a water-soluble salt of at least one oxyacid selected from the group of silicic acid, phosphoric acid, molybdic acid, vanadic acid, permanganic acid, stannic acid, and tungstic acid.

4,105,512

METHOD FOR THE MANUFACTURE OF A SUPERCONDUCTIVE Nb_3SN LAYER ON A NIOBIUM SURFACE FOR HIGH FREQUENCY APPLICATIONS

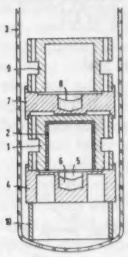
Hans Martens, deceased, late of Erlangen, Fed. Rep. of Germany, by Hildegard Martens; Harald Martens, legal heir; Rainer Martens, legal heir, both of Erlangen, Fed. Rep. of Germany; Hans-Wolfgang Martens, legal heir, Aachen, Fed. Rep. of Germany; Günter Martens, legal heir, Buckenhof, Fed. Rep. of Germany; Sigrid Martens, legal heir, Nuremberg, Fed. Rep. of Germany; Hannelore Martens, legal heir, and Helmut Martens, legal heir, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 15, 1977, Ser. No. 768,831

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2608089

Int. Cl.² C25D *11/02, 5/50;* **H01L** *39/24*

U.S. Cl. 204—38 A **16 Claims**



1. In a method for the manufacture of a superconductive Nb_3Sn layer on a niobium surface for high frequency applications in which tin is diffused into the niobium surface at an elevated temperature, the improvement comprising:

(a) first anodically oxidizing the niobium surface to be provided with the Nb_3Sn layer;

(b) placing said oxidized niobium surface in an evacuable reaction chamber;

(c) evacuating said chamber;

(d) then, after evacuation, exposing the niobium oxide layer so produced to a tin vapor atmosphere in such a manner that a tin layer is formed on the niobium oxide layer; and finally,

(e) heating the niobium surface to a temperature of between 930 and about 1400° C for forming the Nb_3Sn layer.

4,105,513

SOLID ELECTROLYTE CAPACITOR HAVING METALLIC CATHODE COLLECTOR IN DIRECT CONTACT WITH MANGANESE DIOXIDE ELECTROLYTE AND METHOD OF PRODUCING SAME

Atsushi Nishino; Hayashi Hayakawa; Akihiko Yoshida, and Junichiro Umeda, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Limited, Japan

Filed Nov. 3, 1976, Ser. No. 738,574

Claims priority, application Japan, Nov. 8, 1975, 50-13427

Int. Cl.² C25D *11/34;* **H01G** *9/02*

U.S. Cl. 204—38 A **16 Claims**

1. A solid electrolyte capacitor comprising:

an anode body of a valve metal;

a dielectric oxide layer anodically formed on the surface of said anode body;

a solid electrolyte layer of manganese dioxide on said dielectric oxide layer formed by pyrolytic decomposition of an aqueous solution of manganese nitrate applied to the surface of said dielectric oxide layer, at least an outmost portion of said solid electrolyte layer consisting of densely accumulated manganese dioxide particles of about 0.1 to about 50 μm in particle size formed by performing said pyrolytic decomposition in a semi-closed heating chamber of a radiant furnace, said heating chamber being in communication with the atmosphere exclusively through at least one vent which is formed in the wall of said heating chamber and has a predetermined total area such that said pyrolytic decomposition proceeds under a positive pressure of a small magnitude solely attributable to a resistance

offered by said at least one vent to the outflow from said heating chamber of gaseous substances generated upon said pyrolytic decomposition; and

a cathode collector layer formed by plasma spraying of a metal powder on and in intimate contact with said solid electrolyte layer.

4,105,514

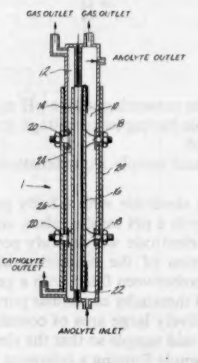
PROCESS FOR ELECTROLYSIS IN A MEMBRANE CELL EMPLOYING PRESSURE ACTUATED UNIFORM SPACING

David D. Justice; Byung K. Ahn, and Ronald L. Dotson, all of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 27, 1977, Ser. No. 810,135

Int. Cl.² C25B *1/16, 1/26, 13/00*

U.S. Cl. 204—98 **27 Claims**

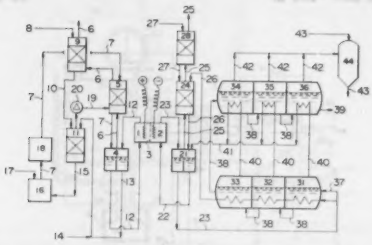


1. A process for electrolysis in an electrolytic cell comprising an anode compartment containing a foraminous anode and an anolyte solution, a cathode compartment containing a foraminous metal cathode and a catholyte solution, a hydraulically impermeable membrane separating said anode compartment from said cathode compartment, spacing means interposed between said anode and said hydraulically impermeable membrane to space apart said anode from said hydraulically impermeable membrane, wherein the process comprises providing a positive pressure differential between said cathode compartment and said anode compartment to maintain contact between said hydraulically impermeable membrane and said spacing means to provide uniform spacing between said anode and said hydraulically impermeable membrane, said positive differential pressure being sufficient to maintain said membrane against said spacing means.

4,105,515
PROCESS FOR ELECTROLYSIS OF ALKALI HALIDE

Shinsaku Ogawa, and Muneo Yoshida, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 29, 1977, Ser. No. 811,277
Claims priority, application Japan, Jul. 5, 1976, 51-78895
Int. Cl.[2] C25B *1/16, 1/26*
U.S. Cl. 204—98 9 Claims



1. In a process for electrolysis of an aqueous alkali halide solution in an electrolytic cell having anode and cathode chambers separated by a cation exchange membrane by feeding an aqueous alkali halide solution into the anode chamber to produce halogen gas in the anode chamber and caustic alkali and hydrogen gas in the cathode chamber, the improvement which comprises carrying out electrolysis while maintaining the pressure in the electrolytic cell at a pressure which is above 1 atm. but not above 7 atm. and maintaining the partial gas pressure in the electrolytic cell within the range from a critical partial gas pressure to five times the critical gas pressure.

4,105,516
METHOD OF ELECTROLYSIS

Aleksandrs Martinsons, Wadsworth, and Harlan B. Johnson, Rittman, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 11, 1977, Ser. No. 814,767
Int. Cl.[2] C25B *1/16, 1/26, 1/02*
U.S. Cl. 204—98 24 Claims

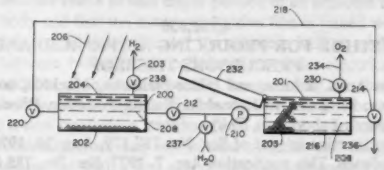
1. In the method of electrolyzing sodium chloride brine in an electrolytic cell by passing an electrical current from an anode of the electrolytic cell, in an aqueous sodium chloride anolyte liquor, through a permeable barrier to an iron cathode of the electrolytic cell, in an aqueous alkaline sodium hydroxide catholyte liquor, evolving chlorine at the anode, and evolving hydrogen at the cathode, the improvement comprising adding a compound of an electrolytic hydrogen evolution catalyzing transition metal to the aqueous sodium hydroxide catholyte liquor of the electrolytic cell while passing an electrical current from the anode to the cathode.

4,105,517
SOLAR PHOTOLYSIS OF WATER

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Porter R. Ryason, La Canada, Calif.

Filed Sep. 30, 1977, Ser. No. 838,336
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—157.1 R 15 Claims

1. A method of photolyzing water comprising the steps of:
applying solar radiation to water in the presence of a photo-oxidizable reagent material which absorbs strongly in the solar range at ground level and is capable of photolyzing water to produce hydrogen with a quantum efficiency exceeding 0.1% and generating hydrogen while forming spent reagent;
contacting the spent reagent with a transition metal ligand complex regenerated in a photoexcited state to reduce and regenerate the reagent;
supporting the reagent or the regenerant on a solid support and dissolving the regenerant or the reagent in water; and



flowing the solution past the solid support during regeneration.

4,105,518
ULTRAVIOLET CURING OF ELECTROCOATING COMPOSITIONS

Vincent D. McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Division of Ser. No. 480,738, Jun. 19, 1974, Pat. No. 4,039,414.
This application Apr. 14, 1977, Ser. No. 787,515
Int. Cl.[2] C08F *8/00;* C25D *13/00*
U.S. Cl. 204—159.14 4 Claims

1. An electrocoating composition dispersed within an aqueous electrocoating bath for electrocoating a paint film onto a cathode substrate, the electrocoating composition comprising an ethylenically unsaturated polymer containing ethylenically unsaturated groups selected from acrylyl, acrylamide, and allyl, the improvement comprising:
said polymer containing at least about 2 percent by weight of an ultraviolet sensitizer attached to the polymer structure;
said polymer having pendent acrylyl unsaturation reacted with a secondary amine selected from morpholine, diethanolamine, methylethanol amine, and diallylamine prior to solubilizing and dispersing said polymer in water;
said secondary amine groups being neutralized with a proton donating solubilizing salt or acid for dispersing said polymer within water;
said polymer being electrocoatable onto a cathode substrate and reactive to ultraviolet energy to cross-link the ethylenic unsaturation and provide a cured paint film.

4,105,519
POLYMERIZATION METHOD USING ULTRAVIOLET LIGHT

Horst Pennewiss, Darmstadt-Neu-Kranichstein; Hermann Plainer, Darmstadt; Peter Quis, Darmstadt-Neu-Kranichstein; Hans Trabitzsch, Seeheim; Juergen Masanek, Pfungstadt, and Juergen Jakob, Lorsch, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Oct. 5, 1976, Ser. No. 729,677
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1975, 2545290
Int. Cl.[2] C08F *2/50, 4/00*
U.S. Cl. 204—159.23 6 Claims

1. A method for the free radical polmerization or copolymerization of at least one unsaturated water-soluble monomer or monomer mixture, alone or in admixture with non-polymerizable inert materials, said monomer or monomers having a content of from 0.2 – 2 equivalents of polymerizable double bonds per 100 grams of the material to be polymerized, which comprises irradiating said monomer or monomers with ultraviolet light while in a layer thickness between 2 and 100 mm, at a temperature between 0° C. and 100° C. and in the presence of atmospheric oxygen, the material to be polymerized further containing at least 1 ppm of a water-soluble anthraquinone substituted in at least the 2-position and unsubstituted in the

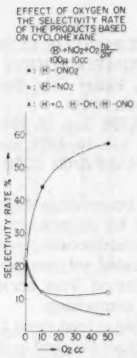
1,4,5 and 8-positions and at least 10 ppm of dissolved chloride ions.

4,105,520

METHOD FOR PRODUCING ADIPIC ACID AND PRECURSORS THEREOF

Wataru Ando, Sakura, and Ichiro Nakaoka, Machida, both of Japan, assignors to Kabushiki Kaisha Pollution Preventing Research Laboratory, Tokyo, Japan

Continuation-in-part of Ser. No. 717,179, Aug. 24, 1976, abandoned. This application Apr. 7, 1977, Ser. No. 785,666
Claims priority, application Japan, Feb. 26, 1977, 52-19819; Apr. 9, 1976, 51-39270
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—162 R 8 Claims



1. the method for producing adipic acid and precursors thereof which comprises reacting cyclohexane with nitrogen dioxide under irradiation of visible rays or ultraviolet rays in the presence of oxygen characterized in that cyclohexane reacts with the stoichiometric quantity or a quantity less than stoichiometry of nitrogendioxide and a quantity less than stoichiometry of oxygen.

4,105,521

CLINICAL PROCEDURE FOR MEASURING LIPOPROTEIN CHOLESTEROLS

Tipton Golias, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Filed Sep. 21, 1977, Ser. No. 835,387
Int. Cl.[2] G01N *27/26*
U.S. Cl. 204—180 S 12 Claims

1. A method of simultaneously determining the concentrations of high density lipoprotein cholesterol, very low density lipoprotein cholesterol and low density lipoprotein cholesterol in a sample of body fluid, comprising the steps of:

(a) applying a small sample of said body fluid to be tested to a solid electrophoresis support media strip,

(b) applying a direct current for a predetermined period of time to said support media until the high density, very low density and low density lipoprotein cholesterols have separated on the media,

(c) applying a developing substrate sensitive to small concentrations of cholesterol and cholesterol esters to the electrophoresed lipoprotein cholesterol strip, and

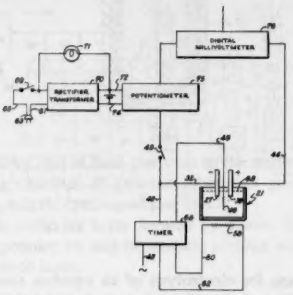
(d) quantitatively determining the concentrations of high density lipoprotein, very low density lipoprotein and low density lipoprotein cholesterols in said body fluid sample from the developed electrophoresed sample.

4,105,522

GLUCOSE LEVEL TEST APPARATUS

Robert M. Friedenberg, 8792 Oxwell La., Laurel, Md. 20810; John L. Yoscak, 2893 Balmoral Dr., Rockville, Md. 20850, and Stephen E. Noren, 1813 Mt. Pisgah La., No. 124, Silver Spring, Md. 20903

Division of Ser. No. 370,238, Jun. 13, 1973, Pat. No. 3,947,328. This application Apr. 21, 1975, Ser. No. 570,092
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 B 11 Claims



1. Apparatus for measuring the glucose level of body fluids comprising means for heating and reacting a small measured liquid quantity of a solution comprising a test fluid body sample and oxidizing agent disposed in a container in quantity to oxidize said sample to a fully oxidized form and leave a measurable remainder of oxidizing agent in said solution, means for controlling the temperature and timing of the oxidation reaction of said solution including means to trigger a timing circuit to hold the temperature at a selected value for a predetermined period, metallic electrodes suspended into contact with the liquid in said container as a primary cell, each of said electrodes having a surface area in direct liquid contact with the said oxidized body fluid whereby to pass the current developed in the reaction product solution electrolytically to said electrodes, means for setting the output circuit of said cell to null voltage and means for measuring the electrical output of said cell in millivolts as redox potential developed in said cell by said oxidized body fluid reaction products.

4,105,523

BIOCHEMICAL OXYGEN DEMAND MEASURING DEVICE

Larry G. Stolarczyk, Raton, N. Mex., assignor to A. R. F. Products, Inc., Raton, N. Mex.

Filed Mar. 31, 1976, Ser. No. 672,514
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 B 7 Claims

1. Apparatus for measuring biochemical oxygen demand of a sample of a given volume comprising, in combination:

a vessel having a volume substantially greater than the volume of the sample adapted to contain the sample thereby providing a space above the sample;

an electrolysis cell having a first chamber and a second chamber and containing an electrolyte in the first and second chambers, said chambers communicating with each other at a level below the level of the electrolyte, said second chamber being closed and providing a closed space above the level of the electrolyte and the first chamber being open to the ambient atmosphere, the closed space of the second chamber being connected to and communicating with the space of said vessel;

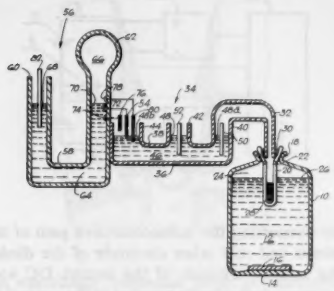
a sensing electrode extending in said first chamber to a predetermined level;

a negative electrode immersed in said electrolyte in said first chamber at a level below said predetermined level;

a positive electrode immersed in said electrolyte in said second chamber;

a constant frequency pulse source of uniform duration and current having a positive output terminal electrically connected to the positive electrode and a negative output terminal electrically connected to the negative electrode;

control means electrically connected to the pulse source for controlling the period of activation of the pulse source,



said control means being electrically coupled to the sensing electrode and activating the pulse source during periods when the level of the electrolyte is below the sensing electrode and deactivating the pulse source during periods when the level of the electrolyte is in contact with the sensing electrode;

and a counter responsive to electrical pulses electrically connected to the pulse source.

4,105,524

OXYGEN CONCENTRATION SENSOR FOR HEATED GASEOUS MIXTURE

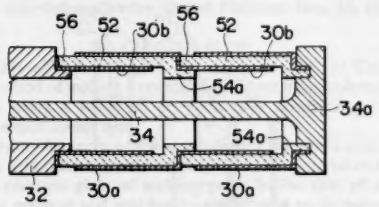
Takeshi Fujishiro, Yokohama; Kiyoshi Wazawa, Fujisawa, and Takeshi Oguro, Yokosuka, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Continuation of Ser. No. 559,925, Mar. 19, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,698

Claims priority, application Japan, Apr. 17, 1974, 49/43121

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 S **2 Claims**



1. A device for sensing differences in oxygen partial pressure between a heated gaseous mixture in a vessel and a reference gas outside the vessel, the device comprising:

(a) an assembly of two identically shaped solid electrolyte oxygen concentration cells,

each of said cells having an open-ended tubular body of a solid oxygen-ion electrolyte ceramic composed of ZrO_2 and CaO, said body having a straight major portion including one end thereof and a cross-sectionally smaller minor end portion which also is straight and includes the other end of the tubular body, and two porous and electrically conductive films of platinum deposited respectively on the outer and inner surfaces of said tubular body, the outside of said minor portion being entirely covered with the outer conductive film,

said cells being joined axially and hermetically with each other such that said minor portion of said tubular body fits into the inside of said major portion of an adjacent tubular body and that the outer conductive film is joined with the inner conductive film of the adjacent cell at each joint between two adjacent cells to give a series electrical connection, so that said assembly has generally the shape of a hollow and straight cylinder which is open at both ends;

(b) a first conductor member fixed to said cylinder to hermetically close one end of said cylinder and electrically connected with a first one of said two conductive films of one of said cells providing said one end of said cylinder, said first conductor member having a rod-shaped portion extending axially through said cylinder;

(c) a second conductor member hermetically fixed to one of said cells providing the other end of said cylinder and electrically connected with a second one of said two conductive films of the cell providing said other end, said second conductor member having a bore exclusively providing communication between the interior space of said cylinder and an exterior atmosphere and allowing said rod-shaped portion of said first conductor member to pass therethrough;

said first conductor member and said second conductor member being made of a corrosion-resistant metal which has a thermal coefficient close to the thermal expansion coefficient of said solid electrolyte and selected from stainless steels and ironchromium alloys; and

said cylinder being disposed in use entirely in said vessel.

4,105,525

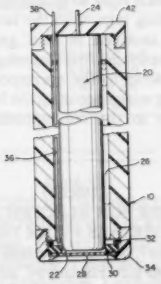
INTERNAL STANDARD ELECTROLYTE FOR AMMONIA SENSOR

John C. Synnott, Belmont, and James W. Ross, Jr., Hull, both of Mass., assignors to Orion Research Incorporated, Cambridge, Mass.

Filed Jan. 23, 1978, Ser. No. 871,622

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 P **1 Claim**



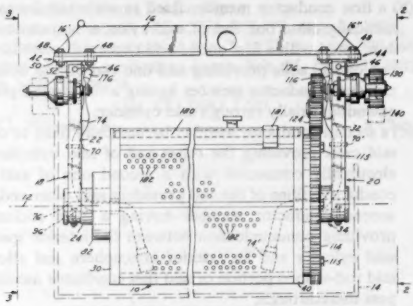
1. In an electrochemical cell for measuring the ammonia content of a sample, said cell including a potentiometric hydrogen ion-sensitive electrode and a reference electrode both in contact with an internal standard electrolyte, said cell having an ammonia-permeable filter arranged to separate the sample from the electrodes and the electrolyte such that ammonia from the sample can pass through the filter into the electrolyte to affect the hydrogen ion activity of the electrolyte, the improvement wherein the internal standard electrolyte comprises a saturated aqueous solution of 5,5'-Nitrilodibarbituric acid ammonium salt.

4,105,526

PROCESSING BARREL WITH STATIONARY U-SHAPED HANGER ARM AND COLLAR BEARING ASSEMBLIES

Wendell G. Lewellen, Jr., Ann Arbor, and Loran A. Lankford, Redford, both of Mich., assignors to Imperial Industries, Inc., Belleville, Mich.

Filed Apr. 28, 1977, Ser. No. 791,669
Int. Cl.² C25D *17/04, 17/20*
U.S. Cl. 204—213 **5 Claims**



1. A processing apparatus comprising an elongated barrel having a rotatable axis and including openings in the ends thereof through which the axis extends, a pair of generally stationary collar bearings having inner and outer portions, with the inner portions of said collar bearings being received in said barrel openings and upon which said barrel is adapted to rotate, the outer portions of said collar bearings having circumferentially extending annular grooves surrounding the axis, a stationary cross bar located above and being spaced from said barrel, said cross bar having a length greater than the length of said barrel, with the end portions of said cross bar extending beyond the ends of said barrel, mounting lugs depending from and being secured to the end portions of said cross bar, said mounting lugs being mounted above and being spaced from the grooves of said collar bearings, a pair of stationary rigid hanger arms located beyond the ends of said barrel for suspending said barrel from said cross bar, each hanger arm being in the form of an elongated rigid strap of U-shape configuration and of generally rectangular cross-section throughout its longitudinal extent, the ends of each rigid strap engaging opposing surfaces of one of the mounting lugs, with the bottoms of the U-shape rigid straps being received in said grooves and wrapped around said collar bearings, first fastening means securing the ends of each rigid strap to the corresponding mounting lug, and second fastening means securing the bottom of each of said U-shape rigid strap to the corresponding stationary collar bearing.

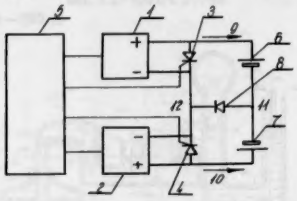
4,105,527

ELECTRIC SYSTEM FOR ELECTRIC EXTRACTION OF NON-FERROUS METALS FROM THEIR SOLUTIONS

Ivan Dimitrov Enchev; Elieser Persiado Ilel; Nikola Tzanov Kunchev; Kiril Georgiev Harizanov, all of Plovdiv; Vladimir Vetov Genevski, Sofia; Nedelcho Draganov Draganov; Alexander Minchev Alexandrov, both of Plovdiv; Georgi Alexandrov Haralampiev, Sofia; Todor Ivanov Smilenov, and Yossif Genchev Stoyanov, both of Plovdiv, all of Bulgaria, assignors to Nipki po Tzvetna Metalurgia, Plovdiv, Bulgaria

Division of Ser. No. 593,777, Jul. 7, 1975, Pat. No. 4,024,035.
This application Jan. 8, 1976, Ser. No. 647,573
Int. Cl.² C25C *1/08, 1/16;* C25B *15/02*
U.S. Cl. 204—228 **1 Claim**

1. In an apparatus for the electric extraction of non-ferrous metals from first and second electrolytic baths each having anode and cathode electrodes associated therewith, a diode, first and second thyratron-like gating elements each having a control electrode and a transconductive path, first and second normally unexcited DC sources each having a control electrode excitable for energizing the associated source, means for connecting like electrodes of the diode and of the first and second baths to a common junction, means for connecting the transconductive path of the first gating means between the other electrode of the first bath and the other electrode of the diode and between the output terminals of the first DC source,



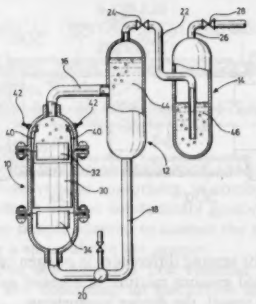
means for connecting the transconductive path of the second gating means and said other electrode of the diode and between the output terminals of the second DC source, and switching means individually coupled to the control electrodes of the first and second gating means and of the first and second DC sources for exciting selected ones of said control electrodes in timed relation.

4,105,528

APPARATUS FOR DECOMPOSITION OF AQUEOUS LIQUID

Shigeta Hasebe, Yokokoshi, Japan, assignor to Haruji Hosoda, Tokyo, Japan

Filed Feb. 25, 1977, Ser. No. 772,250
Claims priority, application Japan, Feb. 28, 1976, 51-21344
Int. Cl.² C25B *15/00*
U.S. Cl. 204—237 **7 Claims**

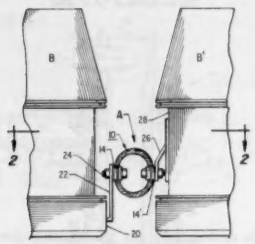


1. Apparatus for the decomposition of aqueous liquid whereby gas is formed comprising a cell, having an inlet at one end and an outlet at the other, positive and negative electrodes mounted within said cell between said inlet and outlet connected to a source of electric current, said electrodes being wound about each other in substantially coaxial helices to form a vortex transverse to the flow of liquid, and magnetic means mounted with said cell at each of the axial ends of said electrodes.

4,105,529
HELICAL INTERCELL CONNECTOR FOR ELECTROLYTIC CELLS

Gerald R. Pohto, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed May 31, 1977, Ser. No. 801,579
Int. Cl.² C25B 9/04
U.S. Cl. 204—267 14 Claims



1. In an electrically connected series of electrolytic cells, comprising a plurality of adjacent, series-connected cells each having an anode portion and a cathode portion and anode and cathode connectors extending respectively therefrom, said anode connector of one cell positioned so as to extend generally in the direction of said cathode connector of an adjacent cell, an intercell connector means for establishing series electrical connection between said anode and adjacent cathode connectors comprising:

a helical member having a plurality of loops and a helical axis disposed between said anode and cathode connectors;

a pair of connecting means engaging said helical member having a longitudinal axis parallel to said helical axis, and

fastening means for establishing positive connection of each of said anode and cathode connectors to an adjacent one of said connecting means.

4,105,530
CORROSION RESISTANT ELECTRODES FOR ELECTROCHEMICAL USE

Alan Stanley William Johnson, Wantage, and Alfred Chan Chung Tseung, London, both of England, assignors to National Research Development Corporation, London, England

Filed Dec. 10, 1973, Ser. No. 423,286
Claims priority, application United Kingdom, Dec. 13, 1972, 57397/72
Int. Cl.² C25B 11/00
U.S. Cl. 204—290 R 11 Claims

1. A method of making a corrosion-resistant electrochemical electrode using a substrate of electrically conducting base material which comprises:

applying to the surface of said substrate a layer of a mixture of an acid-resistant, semi-conducting oxide material and an acid-resistant glass of melting point below that of said oxide material and said base material, said oxide material and said glass being selected to cause said coating to be substantially non-porous while being semi-conducting and

causing the glass in said mixture at some stage of application thereof on the surface of said substrate to become molten whereby a non-porous coating consisting of said glass and oxide material becomes adhered to said substrate.

11. A method of making a corrosion-resistant electrode which comprises:

charging a flame spray gun with a mixture of powdered semi-conducting metal oxide selected from the group consisting of ferric oxide and tin oxide and powdered glass selected from the group consisting of soda-glass and borosilicate glass, said glass constituting up to 30 percent by weight of said metal oxide,

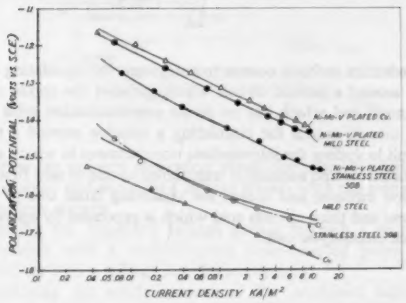
positioning a substrate formed of electrically conducting ferrous metal in a position to receive material sprayed from said spray gun, and

flame spraying said mixture from said spray gun onto said substrate forming on at least a part of the surface thereof an adherent, substantially pore-free layer up to substantially 1 mm. thickness of semi-conducting metal oxide in a matrix of fused glass.

4,105,531
PLATED METALLIC CATHODE

Han C. Kuo; Ronald L. Dotson, and Kenneth E. Woodard, Jr., all of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 660,847, Feb. 24, 1976, Pat. No. 4,033,837. This application Jul. 1, 1977, Ser. No. 812,210
The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.
Int. Cl.² C25B 1/34, 11/04
U.S. Cl. 204—290 R 9 Claims



1. A cathode for use in electrolytic cells comprising:

(a) a copper substrate,

(b) a plating on said copper substrate,

(c) said plating being an alloy of vanadium, molybdenum and nickel,

(d) wherein said plating is applied to said cathode structure by electrodeposition using a bath comprising an aqueous solution of the following:

nickel sulfate	50 to 100 g/l
nickel chloride	5 to 30 g/l
sodium molybdate	1 to 20 g/l
vanadium sulfate	0.1 to 1 g/l

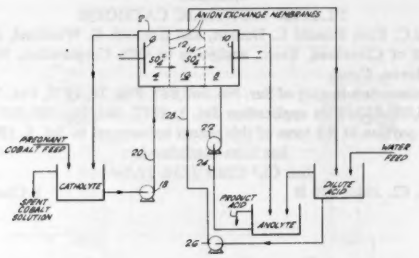
4,105,532
IMPROVEMENTS IN OR RELATING TO THE ELECTROWINNING OF METALS

Kendrick Peter Haines, Havant, England, and Roy Duncan MacPherson, Luxembourg, Luxembourg, assignors to Parel Societe Anonyme, Luxembourg, Luxembourg

Filed Jan. 8, 1976, Ser. No. 647,636
Claims priority, application United Kingdom, Jan. 9, 1975, 1014/75
Int. Cl.² C25C 1/06, 1/08, 7/00, 7/04
U.S. Cl. 204—301 6 Claims

1. In a plant for the recovery of a metal from a material selected from the group consisting of ores, concentrates, mattes and alloys at a cathode of an electrolytic cell in an electrowinning circuit of said plant, the improvement which comprises an electrolytic cell having an anode compartment including an anode, a cathode compartment including a cathode, and an intermediate compartment interposed between the anode compartment and the cathode compartment, the bound-

aries between the anode compartment and the intermediate compartment and between the cathode compartment and the intermediate compartment, each including a separator which is permeable to at least one ionic species which, during operation of said cell, is present in at least one of the compartments bounded by the respective separators, the separator contiguous with the cathode compartment being permeable to anions; means for circulating catholyte around a first circuit which



includes the cathode compartment; means for circulating anolyte around a second circuit which includes the anode compartment and which has no direct communication with said first circuit; means for circulating a solution around a third circuit including the intermediate compartment in which some of the circulated solution is transferred to one of said first and second circuits; and means for removing from one of said second and third circuits acid which is produced by operation of the electrolytic cell.

4,105,533

ELECTRODIALYSIS CELL AND METHOD FOR PRODUCING CATIONIC PERMEABLE MEMBRANES USED THEREIN

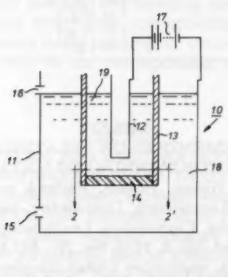
Maurice Antoine de Ramaix, Hove, and Aloijsius Gerardus Somers, Lier, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Jun. 9, 1976, Ser. No. 694,436

Claims priority, application United Kingdom, Jun. 12, 1975, 25223/75

Int. Cl.² B01D *13/02*

U.S. Cl. 204—301 **15 Claims**



1. In an electrodialysis cell having a cationic permeable membrane, the improvement wherein at least an operative portion of said membrane comprises a relatively low porosity interior region constituted of asbestos fibers contained in a cement matrix, opposite exterior strata each having a relatively high porosity micro-sponge structure with a substantial amount of exposed asbestos fibers and a substantially reduced cement content compared to said exterior region, and intervening regions in which the proportion of cement gradually increases toward said interior from said reduced exterior level with a corresponding gradual decrease in porosity.

4,105,534

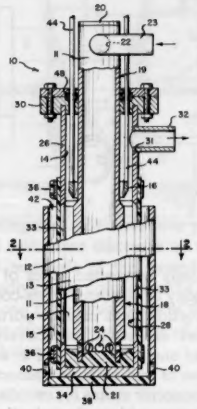
APPARATUS FOR REMOVING IMPURITIES FROM ELECTROLYTE SOLUTIONS

John C. Beatty, III, Ann Arbor, Mich., assignor to John L. Raymond, Fairfield and Robert Z. Reath, Easton, both of Conn.

Filed Aug. 29, 1977, Ser. No. 828,638

Int. Cl.² B01D *13/02*

U.S. Cl. 204—301 **19 Claims**



1. Apparatus for removing ionic impurities from an electrolyte solution by electrodialysis of the solution which comprises an electrolytic cell having an innermost generally tubular electrode that is adapted to be mounted so that the longitudinal axis thereof is substantially vertically disposed, a generally tubular permselective membrane disposed concentrically with respect to the innermost generally tubular electrode and spaced radially outwardly from the outer surface thereof, an outermost generally tubular electrode disposed concentrically with respect to the innermost generally tubular electrode and the generally tubular permselective membrane and spaced radially outwardly from the outer surface of said permselective membrane, and longitudinally movable scraper means for removing precipitated particulate matter from the surface of one of said generally tubular electrodes facing the permselective membrane, the innermost generally tubular electrode and the permselective membrane together defining a generally annular innermost electrolyte compartment through which a first electrolyte solution can be circulated, and the outermost generally tubular electrode and the permselective membrane together defining a generally annular outermost electrolyte compartment through which a second electrolyte solution can be circulated.

4,105,535

CONVERSION OF COAL-DERIVED LIQUIDS WITH A CRYSTALLINE ALUMINOSILICATE ZEOLITE CATALYST

Alan W. Peters, Morrestown, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,019

Int. Cl.² C10G *1/04, 13/02, 1/08*

U.S. Cl. 208—8 **18 Claims**

8. The process of claim 5 wherein the hydrogenation metal assicated with the crystalline aluminosilicate zeolite is nickel.

4,105,536

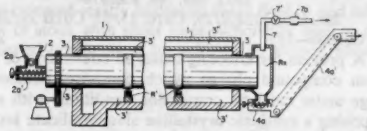
PROCESSES INCLUDING THE PRODUCTION OF NON-CONGEALING SHALE OIL FROM OIL SHALES

Jacque C. Morrell, 4501 Connecticut Ave., NW., Apt. 516, Washington, D.C. 20008

Continuation-in-part of Ser. No. 679,315, Apr. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 455,074, Mar. 27, 1974, Pat. No. 3,954,597. This application Feb. 18, 1977, Ser. No. 769,885

Int. Cl.² C10G *1/02*

U.S. Cl. 208—11 R 9 Claims



1. A continuous process for the production of the shale oil and other products from oil shale which includes removing a relatively large to major amount of the water present in oil shale prior to recovery of the oil by retorting the same to facilitate the rate of recovery of the oil therefrom in the retorting step of the process and to substantially increase the capacity of the latter step in the process which comprises subjecting the said oil shale in subdivided form to heat treatment in a partial dehydration step under relatively milder temperature conditions than that of the retorting step, said partial dehydration step being conduct while rotating the oil shale in a substantially horizontal cylindrical vessel collecting the vapors and gases from the partial dehydration step in the temperature range up to about 550° F to 650° F to remove relatively large to major amounts of free and combined water from the oil shale, and thereafter passing the heated partially dehydrated oil shale to the retorting step for further heat treatment at a substantially higher temperature than that of the dehydration step, in the approximate range of about 800° F to 1000° F, said heat treatments in the partial dehydration and retorting steps, being effected by indirect heat exchange with hot gas, said further heat treatment being conducted while rotating the partially dehydrated oil shale in a substantially horizontal cylindrical vessel withdrawing the vapors and gaseous products resulting from the heat treatment of the same partial dehydration and retorting steps of the process from said rotating substantially horizontal cylindrical vessels, fractionating the vapors withdrawn from the retort whereby there is removed a light overhead product comprising vapors of low boiling hydrocarbons, water, hydrocarbon gases and ammonia and wherein the heavier conversion oil products from the oil shale are condensed and separated as a liquid for further treatment and use.

4,105,537

SYSTEM FOR HANDLING THE UNDERFLOW FROM A PRIMARY SEPARATION VESSEL IN THE TAR SAND HOT WATER PROCESS

Stanley McQuitty, Ft. McMurray, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity, Edmonton; Ontario Energy Corporation; Imperial Oil Limited, both of Toronto; Canada-Cities Service, Ltd., Calgary and Gulf Oil Canada Limited, Toronto, all of Canada

Filed Mar. 7, 1977, Ser. No. 774,927

Int. Cl.² B01D *12/00;* C10G *1/04*

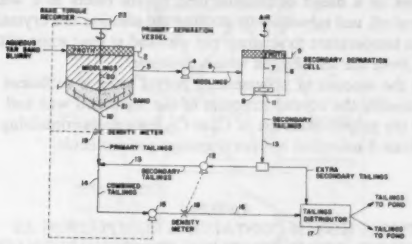
U.S. Cl. 208—11 LE 2 Claims

1. In the hot water process for recovering bitumen from tar sand wherein aqueous tar sand slurry is fed to a primary separation vessel having a tailings outlet and discharge conduit, through which is produced a relatively dry primary tailings stream mainly comprising coarse solids combined with minor amounts of water and bitumen, and a middlings outlet, through which is produced an aqueous middlings stream which is treated in a secondary recovery flotation cell to produce a relatively fluid secondary tailings stream mainly comprising water containing fine solids, at least part of said secondary tailings stream being combined with said primary tailings stream,

the improvement comprising the steps of:

monitoring the solids content of the primary tailings stream;

pumping at least part of the secondary tailings stream with a variable speed first pump through a first conduit which



joins the primary separation vessel discharge conduit to combine said secondary tailings stream with the primary tailings stream;

pumping the combined tailings stream through a second conduit with a variable-speed close-coupled pump to deliver it to a tailings distribution system;

monitoring the solids content of the combined tailings stream;

controlling the close-coupled pump responsive to the solids content of the primary tailings stream to maintain said solids content at a high level to reduce bitumen loss; and

controlling the first pump responsive to the solids content of the combined tailings stream to maintain said solids content at a pumpable level.

4,105,538

PROCESS FOR THE REFINING OF USED MOTOR OILS AND PRODUCTS THEREOF

William J. Mattox, 612 S. Lakeshore Dr., Baton Rouge, La. 70808

Filed Jan. 21, 1977, Ser. No. 761,080

Int. Cl.² C10M *11/00*

U.S. Cl. 208—18 10 Claims

1. A process for selectively refining used motor oil containing contaminants developed in use, comprising contacting said motor oil with an amine soluble in the oil, said amine being selected from the group consisting of dicyclohexylamine, tributylamine, di-2-ethylhexylamine and tripropylamine and having an activity which renders a first portion of said contaminants which does not have corrosion inhibiting properties physically removable but leaves another portion of said contaminants having corrosion inhibiting properties in solution in the oil and physically removing said first portion.

4,105,539

DEWAXING WITH A POLYMERIZED POLYOL ESTER DEWAXING AID

Hans Borst, Oosterbeek, Netherlands; Reginald David Owen Evans, and John Arthur Rand, both of Bromborough, England, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Netherlands

Filed Nov. 17, 1976, Ser. No. 742,606

Claims priority, application United Kingdom, Nov. 18, 1975, 47477/75

Int. Cl.² C10G *43/06, 43/08*

U.S. Cl. 208—33 9 Claims

1. A process for the separation of wax from mineral oil, comprising the steps of forming a solution of an effective amount of a blend of polymerized polyol esters in a waxy mineral oil, and subsequently cooling the solution to a crystallization temperature to separate out wax and at least some of the ester from the solution, in which process:

(a) the amount of polymerized polyol ester is sufficient to modify the crystal structure of the separated wax and

(b) the polyol esters are of C_8 to C_{24} fatty acids containing at least 5 esterified hydroxyl groups per molecule.

4,105,540

PHOSPHORUS CONTAINING COMPOUNDS AS ANTIFOULANTS IN ETHYLENE CRACKING FURNACES

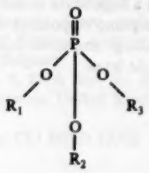
Billy W. Weinland, Conroe, Tex., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 15, 1977, Ser. No. 860,793

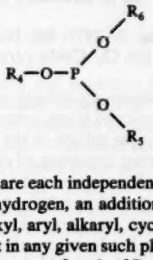
Int. Cl.² C10G *9/16;* C07C *11/04*

U.S. Cl. 208—48 AA 5 Claims

1. A method for reducing fouling in ethylene cracking furnaces using petroleum feedstocks comprising treating the petroleum feedstocks with at least 10 ppm of a compound chosen from the group consisting of phosphite and phosphate esters, said phosphate esters being characterized by the general formula:



where: R_1, R_2, and R_3 are each independently selected from the group consisting of hydrogen, an addition complex of hydrogen with an amine, alkyl, aryl, alkaryl, cycloalkyl, alkenyl, and aralkyl, provided that in any given such phosphate ester at least one and not more than two of each of R_1, R_2, and R_3 are each hydrogen or an addition complex of hydrogen with an amine, and said phosphite esters characterized by the general formula:



where: R_4, R_5 and R_6 are each independently selected from the group consisting of hydrogen, an addition complex of hydrogen and an amine, alkyl, aryl, alkaryl, cycloalkyl, alkenyl, and aralkyl, provided that in any given such phosphite ester at least one and not more than two of each of R_4, R_5, and R_6 are each hydrogen or an addition complex of hydrogen with an amine.

4,105,541

HYDROCARBON CONVERSION OVER ZSM-38

Charles J. Plank, Woodbury, N.J.; Mae K. Rubin, Bala Cynwyd, Pa., and Edward J. Rosinski, Pedricktown, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 808,202, Jun. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 560,412, Mar. 20, 1975, Pat. No. 4,046,859, which is a continuation-in-part of Ser. No. 528,060, Nov. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 393,767, Sep. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 358,192, May 7, 1973, abandoned. This application Nov. 14, 1977, Ser. No. 850,876

Int. Cl.² B01J *8/24;* C07C *15/02;* C01B *29/28*

U.S. Cl. 208—111 29 Claims

1. A process for effecting catalytic conversion of a hydrocarbon compound charge which comprises contacting said charge under catalytic conversion conditions with a catalyst comprising a synthetic crystalline aluminosilicate zeolite having a composition expressed in terms of mole ratios of oxides in the anhydrous state as follows:

$$(0.3\text{–}2.5)R_2O:(0\text{–}0.8)M_2O:Al_2O_3:(x)SiO_2$$

wherein R is an organic cation, M is an alkali metal cation and x is greater than 8 and having an X-ray powder diffraction pattern substantially as shown in Table 1 of the specification, or a thermal decomposition product thereof.

4,105,542

METHOD FOR REMOVING SLUDGE FROM OIL

Morton Fainman, 11200 Homedale St., Los Angeles, Calif. 90049

Filed Dec. 30, 1976, Ser. No. 755,638

Int. Cl.² C10M *11/00*

U.S. Cl. 208—180 36 Claims

1. A method for purifying used oil such as lubricating oil, said used oil having sludge, metal containing compounds, other undesirable components and mixtures thereof contained therein by the steps of:

(a) mixing said used oil with a hydrocarbon diluent so as to dilute said used oil;

(b) mixing said diluted used oil with a water-alcohol mixture comprising (i) a water miscible alcohol, (ii) water, and (iii) a water soluble acid;

(c) heating the resultant mixture formed from steps (a) and (b) to a temperature of from about 40° to 80° C; and

(d) permitting the now-heated resultant mixture to settle for a sufficient length of time so as to cause a phase separation with the sludge and metal containing compounds in one phase and the now-purified diluted oil in another phase.

4,105,543

METHOD FOR SCREENING PAPER FIBER STOCK

Peter Seifert, Middletown, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Continuation of Ser. No. 496,160, Aug. 9, 1974, abandoned, which is a continuation of Ser. No. 288,293, Sep. 12, 1972, abandoned. This application May 14, 1976, Ser. No. 686,490

The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.

Int. Cl.² B07B *1/20*

U.S. Cl. 209—240 3 Claims

1. The method of screening a dilute suspension of paper fiber stock in a screen comprising a supply chamber having as one wall thereof a cylindrical screen member having multiple substantially circular perforations therethrough, a rotor mounted for rotation coaxially with said screen member, and a plurality of vanes carried by said rotor in said supply chamber in angularly spaced relation with each other, said method comprising the steps of

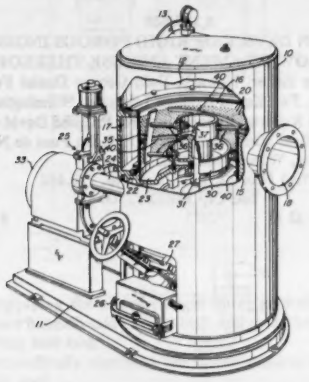
(a) establishing said vanes at a predetermined uniform spac-

ing from said screen member in the range of 3/16 to ¼ inch so that upon rotation of said rotor with said chamber filled with stock, said vanes will cause the stock to form a tubular layer immediately adjacent said screen member which is of a thickness equal to said predetermined spacing,

(b) continuously supplying feed stock to one end of said supply chamber at a rate sufficient to maintain said chamber full,

(c) maintaining a pressure difference from said supply chamber to the accepts side of said screen member to cause passage of accepted stock through said perforations,

(d) continuously driving said rotor to move said vanes at a sufficiently high speed to create a substantially tangentially oriented steady hydraulic shear field in said tubular layer of stock with shear rates sufficiently high to cause elongated contaminant particles to be aligned generally



tangentially of said screen member and thereby to flow past rather than through said perforations,

(e) controlling the speed of said rotor to cause said vanes to travel at a predetermined speed in the range of substantially 3,000 to 12,000 feet per minute which has substantially the same relative position in said speed range as the relative position of the thickness of said tubular layer in said thickness range of 3/16 to ¼ inch,

(f) maintaining the consistency of said feed stock in substantially the same relative position in a range of 0.5–5.0% solids as the relative position of the thickness of said tubular layer in said thickness range,

(g) continuously removing from the other end of said supply chamber a portion of said stock including such contaminant particles, and

(h) continuously recirculating stock from said other end of said supply chamber to said one end thereof.

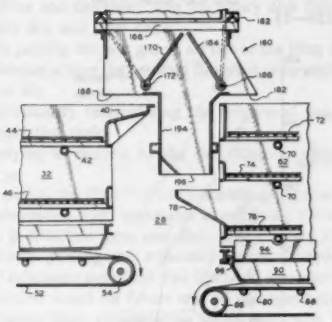
4,105,544

GRAVEL PROCESSING SYSTEM

Ronald A. Stevick, 1100 S. Jackson Rd., Cement City, Mich. 49233

Filed Apr. 26, 1977, Ser. No. 791,156
Int. Cl.[2] B07B *9/00*
U.S. Cl. 209—317 **14 Claims**

1. A gravel processing apparatus for screening and separating gravel comprising, in combination, a frame having a top, bottom, first and second ends, first and second lateral sides and a vertically extending central region, a first vibrating screen mounted on said frame located between said lateral sides, central region and first end, a second vibrating screen mounted on said frame located between said lateral sides, central region and second end, motor means mounted on said frame drivingly connected to said screens for producing vibration thereof, a top loading hopper mounted on said frame at said central region having an upper inlet and first and second outlets vertically located below said inlet, said first outlet selectively communicating with said first screen adjacent said central region and said second outlet selectively communicating with said second screen adjacent said central region, adjustable flow control means within said hopper selectively controlling flow through said outlets, said first screen having an oversize particle discharge adjacent said first end, said second screen having an oversize particle discharge adjacent said second end, a first conveyor mounted on said frame below said first screen receiving the gravel passing therethrough, a second conveyor mounted on said frame below said second screen receiving the gravel flowing therethrough, drive means mounted on said frame selectively driving said conveyors whereby ungraded gravel introduced into said hopper inlet may be selectively



introduced onto said screens and graded gravel removed from said discharges and from said conveyors, said first screen including a first vibratory box resiliently supported on said frame, said second screen including a second vibratory box resiliently mounted upon said frame, said first and second conveyors being mounted below said first and second boxes, respectively, a third screen mounted on said first box directly below said first screen, a fourth screen mounted on said second box directly below said second screen, said first and second conveyors being below said third and fourth screens, respectively, said third screen having an oversize particle discharge adjacent and below said first screen discharge, and said fourth screen having an oversize particle discharge adjacent and below said second screen discharge.

4,105,545

PROCESS FOR REMOVING CYANIDE-CONTAINING COMPONENTS FROM AQUEOUS MEDIA

Albert Muller, Lebanon, N.J., and John M. Schreiner, Brewster, N.Y., assignors to Treadwell Corp., New York, N.Y.

Filed Sep. 14, 1976, Ser. No. 723,205
Int. Cl.[2] C02B *1/38*
U.S. Cl. 210—15 **6 Claims**

1. A process for removing components from an aqueous effluent derived from the treatement of coke-oven gases to remove tars, ammonia, light oils and which has been further treated to remove oil, grease and suspended solids, said effluent containing phenols and simple and metal complexed cyanides and thiocyanates comprising:

(a) bio-oxidizing said effluent to substantially remove said phenol content;

(b) adding to said effluent a surface active compound, said surface active compound being cationic or having a chelating moiety bonded thereto, and

introducing a gas into said effluent to form gas bubbles, the amount of added surface active compound and gas being sufficient to remove from 30% to 90% of the metal complexed and simple cyanides and as a foam atop said effluent, the pH of said effluent contacted with said bubbles being in the range of from about 6 to about 11;

(c) separating said foam from said effluent; and

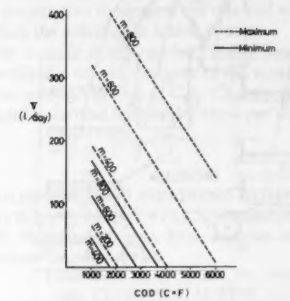
(d) contacting the separated effluent with ozone to substantially remove the remaining simple and metal complexed cyanides and thiocyanates from said effluent.

4,105,546

METHOD OF TREATING WASTE WATER WITH ACTIVATED SLUDGE

Yasushi Kobayashi; Minoru Iwata, both of Himeji; Sadao Yoshida, Ichihara, and Hisashi Akatuka, Himeji, all of Japan, assignors to Idemitsu Kosan Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 590,061, Jun. 25, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,174
Claims priority, application Japan, Jun. 29, 1974, 49-74698
Int. Cl.² C02C *1/06*
U.S. Cl. 210—11 **5 Claims**



1. A method of treating an oil-containing waste water with an activated sludge in an aeration tank which comprises adding a mineral oil hydrocarbon to the waste water in an amount satisfying the formula:

$$6.25\times10^{-5}\times m\times T-6\times10^{-2}\times C\times F>V>2.75\times10^{-5}\times m\times T-6\times10^{-2}\times C\times F$$

wherein V is the amount of added hydrocarbon in liters per day; m is concentration of from about 1000 to about 8000 ppm of the activated sludge, T is capacity of the aeration tank in which the waste water is so treated in 1000 cubic meters per flow rate F; C is Chemical Oxygen Demand concentration of from about 30 to about 65 ppm in the waste water; and F is flow rate of the waste water of from about 50 to about 140 cubic meters per hour of the waste water; and wherein the hydrocarbon is a hydrocarbon fraction containing hydrocarbons having from 4 to 20 carbon atoms per molecule, aerating the mixture of waste water, mineral oil hydrocarbon, and activated sludge for a time effective in reducing said chemical oxygen demand, and passing said mixture to a sedimentation tank to produce a settled sludge and treated waste water.

4,105,547

FILTERING PROCESS

Robert Mauritz Sandblom, Farsta, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Dec. 17, 1975, Ser. No. 641,769
Claims priority, application Sweden, Dec. 23, 1974, 7416257
Int. Cl.² B01D *13/00, 31/00*
U.S. Cl. 210—22 R **7 Claims**

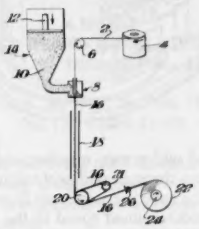
1. A filtering process, especially for ultra-filtration, which comprises flowing a filterable fluid under pressure through a filtering passage extending along one side of a filter, passing one part of said fluid through the filter while discharging an unfiltered part of said fluid from an outlet of said passage, said flow through the filtering passage being provided with a sufficiently high velocity to create a substantial pressure drop along the filter area in the flow direction through said passage, providing a fluid flow in the same said direction in a filtrate passage extending generally parallel to the opposite side of said filter, said passage communicating with each other through the filter, and maintaining in said filtrate passage a pressure drop of the same magnitude and in the same direction as said substantial pressure drop in the filtering passage, whereby the pressure difference between both sides of the filter is maintained substantially constant throughout the entire filter area.

4,105,548

SEPARATION DEVICE OF RIGID POROUS INORGANIC HOLLOW FILAMENT AND USE THEREOF

Richard Anson Baker, Newark, Del.; George Daniel Forsythe, Landenberg, Pa.; Kewal Krishan Likhyani, Wilmington, Del.; Robert Earl Roberts, Kennett Square, Pa., and David Charles Robertson, Bear, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 22, 1977, Ser. No. 770,461
Int. Cl.² B01D *13/00*
U.S. Cl. 210—23 H **5 Claims**



1. A process for separating material from a liquid, comprising flowing liquid through a separation device having greater permeability for said liquid than said material and comprising a three-dimensional network of rigid, criss-crossing, porous inorganic hollow filament through the thickness dimension of the network, the criss-cross pattern of the hollow filament extending in the length width dimensions of the network, the flow of liquid being through the thickness dimension of said network, the network defining tortuous paths for said liquid flowing through its thickness dimension, whereby liquid having reduced concentration of said material permeates through the wall of said hollow filament, collecting the permeated liquid from the interior of said hollow filament, and separately collecting the resultant concentrate of said material.

4,105,549

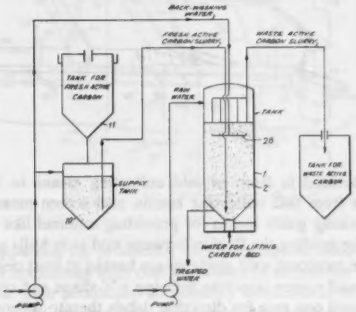
METHOD AND APPARATUS FOR PURIFICATION OF WATER

Yoshiaki Kakumoto, Chigasaki; Mamoru Kanegawa; Takashi Iwaizumi, both of Yokohama, and Nobuo Matsumoto, Tokyo, all of Japan, assignors to Ebara Infilco Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 548,723, Feb. 10, 1975, abandoned. This application Nov. 16, 1976, Ser. No. 742,405
Int. Cl.² C02B *1/14;* B01D *15/02*
U.S. Cl. 210—33 **16 Claims**

1. A method for purifying water or waste water fluid by passing it through a packed bed of active carbon, said packed bed being contained in a tank including an upper columnar section and a lower frustoconical section, comprising the steps of:

(1) supplying said fluid to the upper side of said packed bed, allowing the fluid to flow downwardly through the packed bed, and to leave said bed proximate the lower portion thereof;
(2) preparing a slurry of active carbon by mixing active carbon with a liquid;
(3) periodically interrupting the supply of said fluid to the upper side of said bed and lifting said bed in piston-like fashion by the injection of water at a controlled rate beneath said bed, said water being injected at the region of substantially smallest cross-sectional area of said lower frustoconical section of said tank;



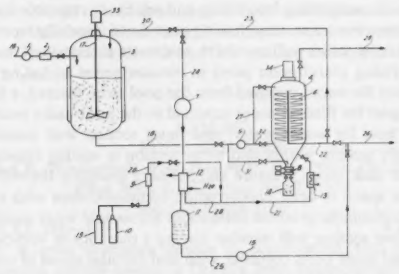
(4) supplying the active carbon slurry periodically into the space beneath said packed bed, said space being formed by lifting said bed;
(5) periodically slurrying the upper portion of the packed bed; and
(6) periodically withdrawing the active carbon slurry formed from the upper portion of the packed bed in an amount corresponding to the amount of the active carbon slurry supplied to the lower portion of the packed layer.
whereby the active carbon constituting the packed bed is intermittently moved upwardly counter-current to the fluid and the active carbon is caused to have a counter-current contact with the fluid, for purposes of purification of said water or waste water by adsorption and filtration.

4,105,550

PREPARATION OF STERILE PRODUCTS

Hans Müller, Im Allmendli, Erlenbach, Zurich, Switzerland

Continuation of Ser. No. 428,345, Dec. 26, 1973, abandoned. This application Aug. 26, 1975, Ser. No. 607,875
Claims priority, application Switzerland, Dec. 23, 1972, 18976/72
Int. Cl.[2] B01D *17/00*
U.S. Cl. 210—50 **4 Claims**



1. A process for obtaining a solid pharmaceutical substance in sterile form comprising the steps, in succession, of

(1) passing a solution of the substance through a sterilizing filter;
(2) then passing the sterilized solution directly from the sterilizing filter into a presterilized precipitation tank where the solution is brought in contact with a precipitating medium so as to form a solids-containing suspension;
(3) thereupon passing the suspension directly from the precipitation tank to a presterilized rotary disk filter where the solids are deposited on the disks as filter cake while the liquid medium is passed out of the filter as the filtrate;
(4) continuously recycling said filtrate into said precipitation tank until it is free of all residual solids;
(5) passing a heated inert gas or heated air through a sterilizing filter and thereafter into the rotary disk filter to completely dry said filter cake;
(6) then passing the wet gas or air out of the filter and into a condenser where the residual filtrate is separated from the gas or air;
(7) continuously recirculating the recovered gas, into the precipitation tank;
(8) applying a vacuum to the disk filter to complete the drying;
(9) subjecting the filter disks to a centrifugal action whereby the deposited solid substance constituting the said filter cake is detached from said disks of the rotary filter, and
(10) finally passing the separated sterile, completely dry solid substance out of the disk filter and into a presterilized collection vessel for future use, all passages between said sterilizing filter, precipitation tank, rotary disk filter, gas or air sterilizating filter and collection vessel as well as all recirculation ducts between said disk filter and precipitation tank and between the disk filter, condenser and precipitation tank being sterilized prior to the operation, and the said sterilizing filter for the solution, precipitation tank, disk filter, gas or air filter and collection vessel together with connecting ducts thus forming a closed sterile system.

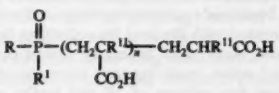
4,105,551

TREATMENT OF AQUEOUS SYSTEMS

Malcolm John Smith, Rose Hill; Peter Miles, Bramhall; Norman Richardson, Middleton, and Michael Anthony Finan, Macclesfield, all of England, assignors to Ciba Geigy (UK) Limited, London, England

Division of Ser. No. 582,402, May 29, 1975, Pat. No. 4,046,707. This application Dec. 29, 1976, Ser. No. 755,604
Claims priority, application United Kingdom, Jun. 11, 1974, 25853/74
Int. Cl.[2] C02B *5/06*
U.S. Cl. 210—58 **6 Claims**

1. A method of inhibiting the precipitation of the scale forming salts of calcium, magnesium, barium and strontium from aqueous systems comprising adding to the aqueous system a scale inhibiting amount in the range of 1–200 ppm of a product comprising a telomeric compound of the formula:



I

or salts thereof, wherein R^{11} is hydrogen or a methyl or ethyl residue and n is a positive integer of at most 100, R is a residue —OX wherein X is a straight or branched alkyl residue having from 1 to 4 carbon atoms, and R^1 is a residue —OX wherein X has its previous significance.

4,105,552
METHOD OF CONTROLLING THE GROWTH OF MICROORGANISMS

Jerry Hoyt Hunsucker, and James R. Selleck, Jr., both of Terre Haute, Ind., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed May 16, 1977, Ser. No. 796,942
Int. Cl.² C02B 3/06
U.S. Cl. 210—64 **5 Claims**

1. A method of controlling the growth of microorganisms by applying to them or to the environment inhabited by them a compound represented by the formula

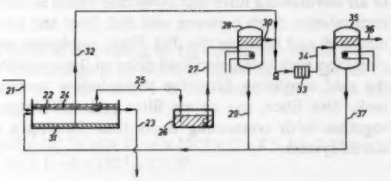
$$CH_2{=}N{-}\underset{\displaystyle R}{\underset{|}{CH}}{-}(CH_2)_xOH$$

where R can be hydrogen, methyl or ethyl and x is 1 or 2.

4,105,553
OIL-CONTAINING EFFLUENT TREATMENT BY GRAVITY SEPARATION

Guy Franklin Oldham, London, England, assignor to The British Petroleum Company Limited, London, England

Filed Mar. 30, 1977, Ser. No. 783,046
Claims priority, application United Kingdom, Apr. 8, 1976, 14294/76
Int. Cl.² B01D 23/00
U.S. Cl. 210—73 W **5 Claims**



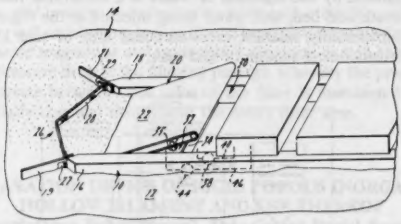
1. A method for the treatment of oil-containing aqueous effluent which method comprises the steps of:
(1) passing the effluent through a gravity separator and obtaining (a) a wet oil fraction, (b) an aqueous fraction of reduced oil content and (c) a wet oily sludge,
(2) heating Fraction (a),
(3) combining the heated Fraction (a) with Fraction (c),
(4) passing the resulting mixture through a filter in such a manner that solids are retained and oil and water are passed through, and
(5) passing the oil and water to a separator and recovering a reusable oil fraction and a water fraction.

4,105,554
OIL SPILL RETRIEVAL SYSTEM

John J. Janson, 14103 Blackburn, Livonia, Mich. 48154

Filed May 31, 1977, Ser. No. 802,026
Int. Cl.² E02B 15/04
U.S. Cl. 210—96 R **13 Claims**

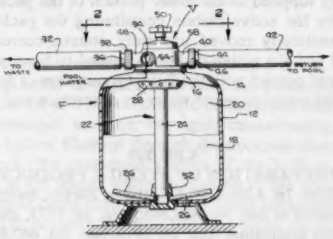
1. An oil retrieval system for retrieving oil spills and the like from bodies of water such as seas, lakes or the like and being operable from a boat, said system comprising: collecting means operatively connected with the boat for collecting the oil from the surface of the water, said collecting means collecting a mixture of oil and water, receiving tank means located on the boat for receiving the mixture of oil and water, separating means operatively connected with said receiving tank means for separating the oil and water, storage means for receiving and holding the separated oil, discharge means for discharging the water back to the body of water, monitor means for analyzing the water to be discharged and providing a first signal when the quantity of oil in the water is at a preselected low level and a second signal when the quantity of oil in the water is above said low level, said discharge means operable for discharging the water in response to said first signal and response to said second signal for transmitting the water to said separating means for an additional cycle, said boat being of a twin hull construction and with said collecting means located between said twin hulls, screen means including a screen structure located in front of said collecting means to block out debris from said collecting means, said screen means further comprising guide means for providing a funnel like construction for guiding the fluid in between said twin hulls and to said screen structure, said guide means having at least one gate and with said screen structure defining a V-shape and cooperating with said one gate for directing debris thereto whereby debris can be exited.



4,105,555
MULTI-PORT VALVE

Leroy I. Pease, Diamond Bar, Calif., assignor to Tolo, Incorporated, Santa Ana, Calif.

Filed Dec. 6, 1976, Ser. No. 747,596
Int. Cl.² B01D 23/24
U.S. Cl. 210—136 **33 Claims**

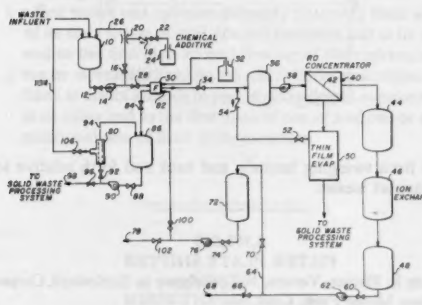


1. Multiple use mode non-plug valve for a swimming pool filter of the type passing water under pressure through a backwash regenerable filtering medium disposed in a filter tank, said valve comprising interfitting and relatively rotatable inner and outer circular sections having nested and coaxially tapered annular respective wall members, said outer section wall member defining plural outer ports in circular series including an inlet port for water pumped from the pool to be filtered; a first outlet port for filtered water returned to the pool; and a second outlet port for waste water; said inner section wall member normally seating within said outer section in sealing response to filter tank water pressure and defining inwardly thereof an interior space in open unobstructed communication with said tank to eliminate pressure imbalances across said inner section, said inner section wall member having a plurality of vertically disposed inner ports coplanar with said circular series of outer ports and circularly spaced to alternate communicate in water passing relation two of said outer ports in registering response to relative rotation of said wall members while blocking water passage through the other outer port.

4,105,556
LIQUID WASTE PROCESSING SYSTEM

Eugene Raymond D'Amaddio, Enfield, and David Norman Enegess, Broad Brook, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 18, 1976, Ser. No. 659,053
Int. Cl.[2] B01D *35/00*
U.S. Cl. 210—152 4 Claims



1. An apparatus for producing very pure liquids from influent liquids containing high concentrations of impurities while at the same time producing an impurity concentrate of very high concentrations and low volume, wherein the apparatus comprising in combination:

a. a reverse osmosis concentrator having a semipermeable membrane and having an inlet for receiving a stream of waste fluid, an outlet for discharging purified permeate which has passed through said semipermeable membrane, and an outlet for discharging a concentrate;

b. a thin-film evaporator connected to said reverse osmosis concentrator's concentrate outlet, said thin-film evaporator having an outlet for discharging a distillate and an outlet for discharging a concentrate having a high solids content;

c. means upstream of said reverse osmosis concentrator for filtering the stream of waste fluid, said filter means including a means for back-flushing said filtering means with a cleaning fluid; and

d. means upstream of said filtering means for introducing chemicals into the stream of waste fluid, said chemical introduction means including:

1. a hold-up tank for collecting the stream of waste fluid;
2. a pump in fluid communication with said hold-up tank;
3. a recirculation line connecting said pump and said hold-up tank;
4. an eductor in said recirculation line, said eductor having a primary inlet and a secondary inlet, said primary inlet being in fluid communication with said pump; and
5. a source of chemical additive, said source being connected to said secondary inlet of said eductor such that the chemicals from said chemical source are selectively entrained in the flow of fluid passing through said eductor.

4,105,557
POOL SKIMMER

Brian R. Weatherholt, P.O. Box 4027, Bay Pines, Fla. 33504

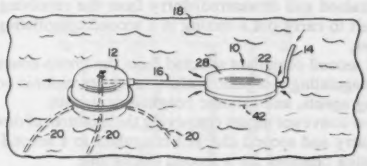
Filed Mar. 9, 1977, Ser. No. 775,973
Int. Cl.[2] E04H *3/20*
U.S. Cl. 210—169 9 Claims

1. A pool skimming device in combination with a pool sweeping device having a flexible hose interconnecting the pool sweeping device to a source of water pressure, the sweeping device comprising a surface unit and a plurality of flexible sweeping arms connected to the surface unit to propel the pool sweeping device within the pool, the improvement comprising in combination:

a body member for said pool skimming device having a specific gravity substantially less than one enabling said body member to provide buoyancy for said combination;

said body member having a central cavity communicating with an open bottom in said body member;

mounting means for rigidly mounting said body member to the surface unit of the pool sweeping device to provide floatation to the surface unit of the pool sweeping device and for moving said body member in accordance with the movement of the pool sweeping device;



filter means established relative to said open bottom of said body member;

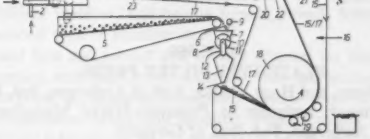
a plurality of water input means communicating with said central cavity of said body member to enable surface water of the pool to enter said central cavity and to exit through said open bottom with said filter means collecting debris accompanying the surface water upon movement of the pool sweeping device; and

said plurality of water input means including one-way gate means located on opposed sides of said body member.

4,105,558
APPARATUS FOR DRAINING OF MUDDY LIQUIDS

Hans J. Heinrich, Wilhelmshoherstr. 129, 5828 Ennepetal; Bernd Koslowsky, Theodor-Heuss-Str. 50, and Egon Hoffmann, Funckstr. 63, both of 56 Wuppertal 1, all of Germany

Division of Ser. No. 656,181, Feb. 9, 1976, abandoned. This application Dec. 2, 1976, Ser. No. 746,680
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2515162
Int. Cl.[2] C02C *3/00;* B01D *3/14*
U.S. Cl. 210—199 5 Claims



1. Apparatus for draining of muddy liquids comprising:

an inlet feedline through which a muddy liquid passes to empty into a first coagulating chamber;

a dosing device communicating with said inlet feedline to add a charged ionic coagulant selected from the group consisting of flocculating inorganic ionization agents and cationic coagulating agents into said inlet feedline;

a first coagulating chamber communicating with said feedline fitted with an overflow funnel for mixing of ionic coagulant and muddy liquid entering from said feedline and in which thickening occurs to form a thick slurry which flows out of said overflow funnel and deposits onto

an endless revolving screen belt where it is strained and dewatered;

a revolving screen belt below said funnel having a scraper knife at its remote discharge end for aiding removal of strained and dewatered slurry onto a receiving funnel and thereafter into a second mixing and coagulating chamber by means of a screen conveyor means;

a receiving funnel to receive the strained and dewatered slurry;

a spray dosing device mounted over said receiving funnel which contains a second charged ionic coagulant opposite in charge to said first ionic coagulant;

a spray dosing inlet pipe means into which said second charged ionic coagulant enters for later addition to the strained and dewatered slurry from the revolving screen belt to carry out a mixing in a second coagulating chamber;

said second coagulant selected from the group consisting of coagulating inorganic ionization agents, anionic coagulating agents, and cationic coagulating agents;

screw conveyor means conveying the mixtures of dewatered slurry and second charged coagulant to a second coagulating chamber for a second thickening;

a second coagulating chamber which communicates with said spray dosing inlet pipe means for carrying out a second coagulation with the second coagulant and the strained and dewatered slurry;

slit means below said second coagulating chamber for discharging thickened sludge;

a receiving belt below said slit means wherein the slit of said slit means is transverse to the running direction of said belt to facilitate moving the second thickened slurry toward a two step screening belt for further dewatering by pressing and filtering;

a two step screening belt assembly which is series connected to said receiving belt, said assembly comprising two screening belts coming together at a nip into which the second slurry enters from said receiving belt, a perforated drum about which said two screening belts wind and press towards each other, a drain and contact rollers pressing and belts towards each other adjacent to the exit side of said drain; and

a series of longitudinally disposed supporting rollers for said two step screening belt assembly on opposite sides of said belts for progressively pressing the two belts with said sludge therebetween at greater pressures than said constant rollers of said perforated drum whereby a dry filter cake is discharged at the end of said two step screening belt assembly, the first step of said pressing occurring at the underside of some of the supporting rollers in one direction and the second step of said pressing occuring at the top side of the same supporting rollers in the other direction.

4,105,559

PLATE-TYPE FILTER PRESS

Oswald Busse, and Hugo Klesper, both of Aarbergen, Fed. Rep. of Germany, assignors to Passavant-Werke Michelbacher Hutte, Aarbergen, Fed. Rep. of Germany

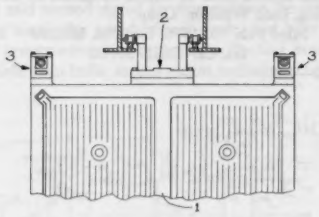
Continuation-in-part of Ser. No. 701,081, Jun. 30, 1976, Pat. No. 4,076,033. This application Apr. 4, 1977, Ser. No. 784,611

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618437

Int. Cl.² B01D *25/32*

U.S. Cl. 210—225 **5 Claims**

1. A plate-type filter press comprising vertically extending filter plates suspended by centrally disposed upper support means for horizontal stepwise movement to define a space between adjacent filter plates, a flushing device having horizontally arranged spray nozzles and mounted for movement from a position below said filter plates into and within the confines of said space between adjacent filter plates, guide means carried by at least one upper corner of each filter plate, and an elongated guide member extending horizontally and parallel to said upper support means adjacent said upper corner in position to engage said guide means and prevent the filter



plates from swinging laterally and back and forth relative to said support means.

4,105,560

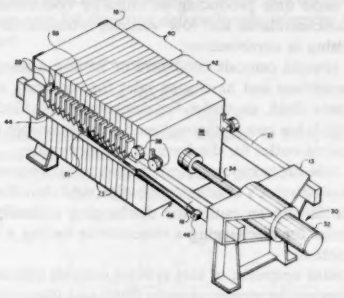
FILTER PLATE SHIFTER

William L. Fismer, Verona, N.J., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Feb. 14, 1977, Ser. No. 768,018

Int. Cl.² B01D *25/14*

U.S. Cl. 210—230 **12 Claims**



7. A filter press for mechanically separating solids from liquid, slurries, suspensions and the like, comprising:

a. a rigid frame including a first stationary end member which is a filter press head, a second stationary end member, and a pair of elongated side rail members which extend horizontally and parallel to each other and which are supported at their opposite ends by said stationary end members;

b. a first set of filter plate members mounted for sliding movement on said side rail members;

c. one or more additional sets of filter plate members mounted for sliding movement on said side rail members and disposed between said first set of filter plate members and said second stationary end member;

d. a last set of filter plate members mounted for sliding movement on said side rail members and disposed between said second stationary end member and the set of said one or more additional sets which is farthest from said first set;

e. means interconnecting the plates in each of said sets to allow limited travel of the interconnected plates away from one another while also allowing adjacent plates to move into abutting relationship with one another;

f. a slide head member slidably mounted on said side rail members between said second stationary end member and the first plate of said last set of filter plate members;

g. means connecting said slide head to said first plate of said last set of filter plate members;

h. ram means fixed to said second stationary end member

and connected to said slide head member to reciprocatively move said slide head member in one direction of travel to separate the filter plates of said last set of filter plate members by action of said connecting means between said slide head member and the first filter plate of said last set of filter plate members and in the opposite direction of travel to force the filter plates of said sets into abutting relationship;

i. a first piston and cylinder assembly pivotably fixed at one of its ends to one of said side rail members and at its other end to the first plate of said first set of filter plates; and

j. one or more additional piston and cylinder assemblies each fixed at one of its ends to one of said side rail members and at its other end to the first plate of one of said one or more additional sets of filter plate members.

4,105,561

DIRECTIONAL FILTER

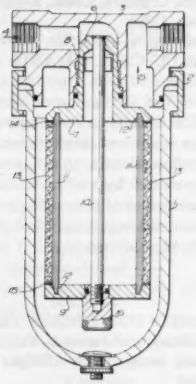
Keith Raphael Domnick, East Boldon, England, assignor to Domnick Hunter Engineers Limited, United Kingdom

Filed Feb. 6, 1975, Ser. No. 547,454

Claims priority, application United Kingdom, Feb. 16, 1974, 7163/74

Int. Cl.² B01D *25/02*

U.S. Cl. 210—232 **11 Claims**



1. A filter device comprising in combination: a self-supporting tubular microporous layer of a filter medium wherein the filter medium includes fibers providing a plurality of pores within a range of pore sizes substantially less than 50 microns; a binding material reinforcing said fibers; end caps of which each end cap defines an annular channel within a wall face thereof; one of said caps being at one end and another of said caps being at an opposite end of the tubular microporous layer mounted thereon; each end of the tubular microporous layer being held in a respective one of said annular channel against the channel-defining wall face thereof, of the end caps at opposite ends of the tubular microporous layer; each end cap comprising at least one impermeable member, each channel having a tapering cross-section which constricts towards a floor of the annular channel, adapted such that on assembly, end regions of the tubular microporous layer are compressed within the channels against the channel-defining wall faces of the end caps; and the filter medium layer forming an impermeable compression seal with the respective channel-defining walls of the end caps.

4,105,562

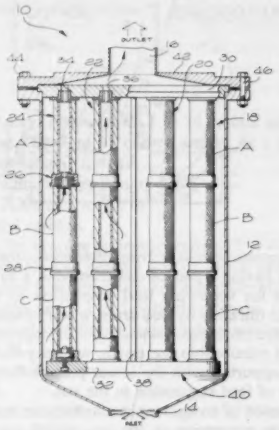
FILTERING APPARATUS WITH MODULAR FILTER ELEMENTS

Stephen J. Kaplan, Woodland Hills, and Rodolfo Gaba, Simi Valley, both of Calif., assignors to Textron Inc., Providence, R.I.

Continuation of Ser. No. 683,880, May 6, 1976, abandoned. This application May 9, 1977, Ser. No. 794,890

Int. Cl.² B01D *29/24*

U.S. Cl. 210—232 **9 Claims**



1. Filter apparatus constructed of metallic tubular modular interchangeable filter elements for filtering fluids having a high viscosity, a high temperature and a high pressure comprising:

A. a plurality of filter means including a plurality of tandemly threadably interconnected metallic tubular modular filter elements, each of said metallic tubular modular filter elements including:

1. a metallic filter member including a perforate tubular member and a filter media of metallic fiber;

2. a first metal end fitting having a first metal surface and being permanently affixed to one end of said tubular member, and having male threads formed of a first type of stainless steel;

3. a second metal end fitting having a second metal surface and being permanently affixed to the other end of said tubular member, and having female threads formed of a second type of stainless steel;

4. said first and second end fittings adapted for threadably mating with each other with said first and second metal surfaces on adjacent elements in metal-to-metal sealing engagement when said modular filter elements are tandemly interconnected to form a filter means, said metal-to-metal seal being the only seal between adjacent modular filter elements; and

5. said threaded portions of said first and second fittings being constructed of dissimilar stainless steel non-galling metals;

B. a metal header assembly defining a plurality of threaded recesses adapted for threadably receiving said first end fitting on one of said modular elements;

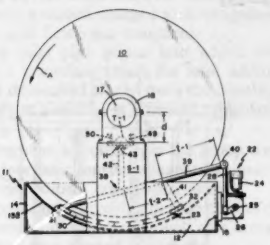
C. a metal base assembly including plug means adapted for receiving and retaining said second end fitting on another of said modular elements; and

D. a metal housing surrounding said header and base assemblies with said plurality of filter means supported therebetween.

4,105,563
CONTINUOUS DRUM FILTER WITH IMPROVED AGITATOR STRUCTURE

Vaino J. Kosonen, West Redding, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Jun. 6, 1977, Ser. No. 788,265
Int. Cl.[2] B01D 33/34
U.S. Cl. 210—383 21 Claims



1. In a continuous rotary drum filter unit comprising a rotary filter drum having a pair of end trunnions, a filter vat having feed means for supplying feed suspension to the vat, to be subjected to filtration by said drum, a pair of main bearings for the respective trunnions, associated with respective ends of the vat in fixed relationship therewith, whereby the filter drum is rotatably supported with the lower portion thereof immersed in the bath of feed suspension in the vat,

the provision of an agitator mechanism for maintaining feed solids in suspension in the vat, which mechanism comprises an agitator frame structure having a curved frame shaped so as to conform substantially to the circular curvature of the filter drum at the underside thereof, and in radially spaced relationship therewith, said agitator frame structure extending within the vat substantially from end to end of the filter drum,

a pair of rubber torsion bearings disposed below the respective trunnsions and aligned so as to define an oscillatory axis for said agitator frame structure, extending parallel to, and spaced vertically downwardly from the trunnions axis,

support means for said torsion bearings, fixedly associated with the respective ends of the vat, said torsion bearings comprising a center vearing pin fixed relative to said support means, a rubber filler in the form of a thick walled annular member surrounding the center pin and secured thereon against rotational slippage, and a housing surrounding said annular rubber member sufficiently tight to prevent slippage between the rubber member and the housing when torque is applied to the housing relative to the fixed center pin, by oscillatory movements imparted to the agitator frame structure,

an end suspension structure extending rigidly from each end of the curved frame towards the respective torsion bearing, and in a plane perpendicular to the oscillatory axis,

a hinge connection between said bearing housing and the associated end suspension structure of the agitator frame structure, with a hinge axis extending at right angles to the trunnion axis,

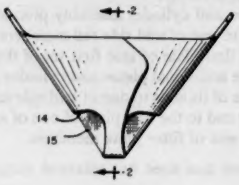
and actuating means for imparting said oscillating movements to the agitator frame structure.

4,105,564
PAINT STRAINER

James P. Whelan, Plymouth, Mass., assignor to Ad-Tec Products, Inc., Plymouth, Mass.

Filed May 14, 1976, Ser. No. 686,302
Int. Cl.[2] B01D 29/10
U.S. Cl. 210—497 R 1 Claim

1. A wide-mouthed, conical paint strainer comprised of stiff paperboard constituting a shape-retaining supporting structure for holding a quantity of paint, said structure having an upper open mouth, a downwardly tapering conical side wall and a truncated lower end containing an upwardly concave imperforate bottom which forms interiorly of the structure at the bottom an imperforate elevation bounded by an annular gutter, said side wall containing in its lower half, openings, the lower



edges of which coincide with the bottom of the gutter below the apex of the elevation and a cloth covering mesh secured to the side wall at the inner side over said opening and the interior imperforate elevation, said mesh constituting the outer side and bottom of the gutter and said imperforate elevation constituting the inner side of the gutter.

4,105,565
PRODUCTION OF CALCIUM HYPOCHLORITE COMPOSITIONS FROM QUICKLIME AND DICHLORINE MONOXIDE

John A. Wojtowicz, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 1, 1977, Ser. No. 820,669
Int. Cl.[2] C09K 3/00; C01B 11/06
U.S. Cl. 252—1 10 Claims

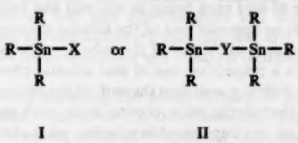
1. A process for the production of a calcium hypochlorite composition which comprises reacting solid granular quicklime and a gaseous mixture of dichlorine monoxide and an inert gas to form a reaction mixture, agitating said reaction mixture and recovering a calcium hypochlorite composition having an available chlorine content of at least 50 percent therefrom, said gaseous mixture containing from 1 to about 30 percent by volume of said dichlorine monoxide.

4,105,566
DISPERSION FOR TIMBER TREATMENT

Glynn Miller, Oldbury, and James E. Stephenson, Birmingham, both of England, assignors to Albright & Wilson Limited, Warley, England

Filed Nov. 1, 1976, Ser. No. 737,333
Claims priority, application United Kingdom, Nov. 4, 1975, 45843/75
Int. Cl.[2] C09K 3/28; B27K 3/50
U.S. Cl. 252—8.1 28 Claims

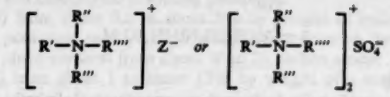
1. An aqueous composition comprising from 0.01% to 2.0% by weight of an organotin compound of the formula I or II



I II

wherein each R is the same or different alkyl groups having from 1 to 10 carbon atoms, Y is an oxygen atom or a sulphur atom, and X is a halogen atom, an acetate group or an acrylate or methacrylate group;

from 0.02% to 15.0% by weight of a quaternary ammonium salt having the formula

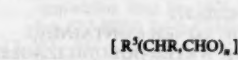


wherein R'' and R''' are selected from the group consisting of alkyl groups having from 1 to 6 carbon atoms, R' is a benzyl group, a nuclear alkylated benzyl group having an alkyl substituent containing from 8 to 15 carbon atoms, or an alkyl group having from 8 to 20 carbon atoms, R'''' is a phenyl oxyalkylene group containing from 1 to 6 oxyalkylene groups or an alkyl group having from 8 to 18 carbon atoms, and Z is a halide;

from 0.1% to 55% by weight of a mixture of the ammonium salts of a plurality of polyphosphoric acids which mixture has been produced by the neutralization of an aqueous solution comprising from 80 to 86% by weight of phosphorus pentoxide with ammonia or a basic derivative thereof at a temperature of from 15 to 70° C and a pH of from 4 to 12 to substantially avoid any hydrolysis of the polyphosphoric acid species present;

from 0.05% to 30% by weight of a derivative of carbamic acid selected from the group consisting of urea, dicyandiamide and quanidine;

from 0.02% to 3.0% by weight of one or more hydrotropes selected from the group consisting of (i) phosphate esters of the formula



wherein R, is a hydrogen atom or a methyl group, *n* has an average value in the range 5.0 to 9.0, R^5 is the same or different branched or straight chain alkyl group or alkyl substituted aromatic hydrocarbon group having from 8 to 15 carbon atoms, *x* is 1 or 2, $x+y=3$ and the molar ratio of the compounds wherein *x* has a value of 1 to those wherein *x* has a value of 2 is in the range 1.3 : 1 to 10.0 : 1, and (ii) the alkali metal or ammonium salts of a xylene sulphonic acid (all weights being expressed on the dry weight of the dispersion); and

at least 55% by weight of water (based on the weight of the aqueous dispersion).

4,105,567

ORGANOSILICON COMPOUNDS AND TEXTILE FIBER FINISHES CONTAINING THEM

Götx Koerner, Essen, and Hans-Jürgen Patzke, Gelsenkirchen-Resse, both of Germany, assignors to Th. Goldschmidt AG, Essen, Germany

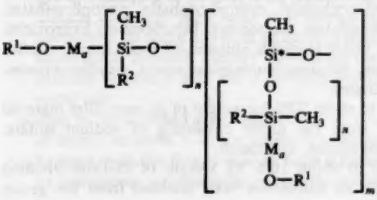
Filed Jan. 4, 1977, Ser. No. 756,681

Claims priority, application United Kingdom, Feb. 12, 1976, 05602/76

Int. Cl.² D06M *13/10*

U.S. Cl. 252—8.6 **13 Claims**

1. Compounds of the general formula



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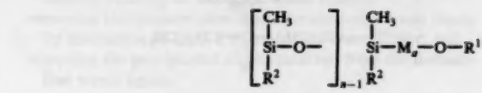
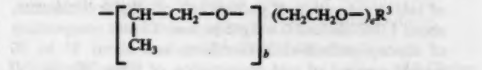


in which

R^1 is an alkylated phenyl residue,



in which

R^3 is an alkyl residue with 1 to 16 carbon atoms, an acyl residue with 1 to 12 carbon atoms, or a hydrocarbon substituted aryl residue,

b has a value of 0 to 2, and

c has a value of 1 to 30, or

a trimethylsilyl residue,

and wherein the average molecule contains 5 to 40 Si atoms, of which at most 20 mole percent are Si* atoms and 0.2 to 5 are alkylated phenyl residues which are linked directly to Si atoms via M_a-O bonds, and 0.2 to 5 polyether blocks, and

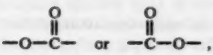
M is a bivalent substituted hydrocarbon residue, the indices

n is 2.5 to 20,

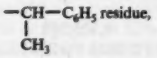
m is 0 to 5, and

a is 0 or 1,

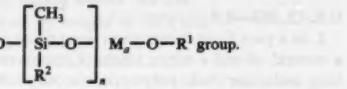
R^2 is a substituted alkyl residue with 1 to 16 carbon atoms, whose carbon chain may be interrupted by the groupings



the M_a-O-R^1 residue, or the



R^4 is an alkyl residue with 1 to 16 carbon atoms, or the



4,105,568

FINISH FOR POLYESTER FILAMENTARY YARNS

Robert Moore Marshall, Chester, and Kimon Constantine Darboufas, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

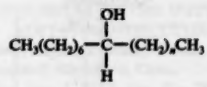
Division of Ser. No. 653,974, Jan. 30, 1976, abandoned. This application Mar. 2, 1977, Ser. No. 773,719

Int. Cl.² D06M *13/52*

U.S. Cl. 252—8.6 **1 Claim**

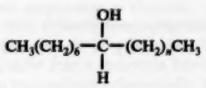
1. A two-part liquid finish particularly for application to polyethylene terephthalate filamentary yarn prepared by a process involving spinning and drawing steps, comprising:

(a) a first composition consisting essentially of about 10 to 20 weight percent of said composition of refined coconut oil, about 10 to about 20 weight percent of said composition of a stearic acid ester prepared from a mixture of secondary alcohols having the general chemical structure



where *n* is 5–6, about 3.0 to about 6.0 weight percent of said composition of ethoxylated tallow amine, about 10 to about 20 weight percent of said composition of ethoxylated lauryl alcohol, about 8.0 to about 12.0 weight percent of said composition of sodium salt of alkylarylsulfonate, about 1.0 to about 3.0 weight percent of said composition of dinonyl-sodium-sulfo-succinate, and about 35 to 50 weight percent of said composition of white mineral oil having a boiling point of between 510° and 620° F., said first composition being applied to said yarn as a spinning finish prior to drawing said yarn; and

(b) a second composition consisting essentially of about 13 to about 25 weight percent of said composition of a compound selected from the group consisting of glycerol monooleate and decaglycerol tetraoleate with ethoxylated tall oil fatty acids, about 12 to about 20 weight percent of said composition of a compound selected from the group consisting of sulfated glycerol trioleate and ethoxylated tallow amine, and about 55 to about 75 weight percent of said composition of a stearic acid ester prepared from a mixture of secondary alcohols having the general chemical structure



where *n* is 5–6, said second composition being applied to said yarn after drawing said yarn, whereby said yarn provides improved performance when said yarn is used in tire cord in pneumatic tires.

4,105,569

YARN FINISH FORMULATION

Roger J. Crossfield, Matthews, N.C., assignor to George A. Goulston Co., Ltd., Monroe, N.C.

Filed Feb. 7, 1977, Ser. No. 766,281
Int. Cl.[2] D06M *13/10*
U.S. Cl. 252—8.6 **26 Claims**

1. In a yarn finish formulation comprising a major amount of a mineral oil and a minor viscosity improvement amount of a long molecular chain polymeric viscosity index improver, the improvement comprising a minor surface tension and mist reduction amount of a polysiloxane present in said yarn finish formulation.

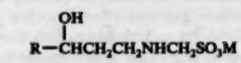
4,105,570

OIL RECOVERY BY SURFACTANT WATERFLOODING

Stamoulis Stournas, Flemington, N.J., and Joseph J. Dickert, Jr., Lower Makefield Township, Bucks County, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 29, 1977, Ser. No. 782,594
Int. Cl.[2] E21B *43/22*
U.S. Cl. 252—8.55 D **4 Claims**

1. In a method for the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems in which an aqueous fluid is introduced into said reservoir via said injection system to displace oil to said production system, the improvement comprising employing as at least a portion of the fluid introduced into said injection system an aqueous liquid containing a water-soluble anionic surfactant characterized by the formula



wherein

R is an aliphatic hydrocarbon group or an aliphatic-substituted aryl hydrocarbon group providing a lipophilic base, and

M is an alkali metal, ammonium, or substituted ammonium ion.

4,105,571

LUBRICANT COMPOSITION

Harold Shaub, New Providence, and Walter E. Waddey, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 22, 1977, Ser. No. 826,544
Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—32.7 E **19 Claims**

1. A storage stable lubricating oil composition comprising a major portion of lubricating oil, from about 0.01 to about 5.0 parts by weight of zinc dihydrocarbyl dithiophosphate, from about 0.01 to about 1.0 parts by weight of an ester of a polycarboxylic acid with a glycol and from about 0.1 to about 30 parts by weight of an ashless dispersant containing a high molecular weight aliphatic hydrocarbon oil solubilizing group attached thereto, all weights based on 100 parts by weight of said lubricating oil.

4,105,572

FERROMAGNETIC TONER CONTAINING WATER-SOLUBLE OR WATER-SOLUBILIZABLE RESIN(S)

Emery John Gorondy, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 31, 1976, Ser. No. 672,554
Int. Cl.[2] H01F *1/00, 1/26;* G03G *9/08*
U.S. Cl. 252—62.1 P **54 Claims**

1. Ferromagnetic toner for magnetically printing a substrate, said toner comprising:

(a) at least one ferromagnetic component;

(b) at least one member of the group consisting of dye and chemical treating agent, said agent being selected from the group consisting of flame-retarding agent, biocide, ultraviolet light absorber, fluorescent brightener, dyeability modifier, soil-release agent and water-proofing agent; and

(c) a readily fusible, aqueous scour-removable water-soluble or water-solubilizable resin which substantially encapsulates (a) and (b).

4,105,573

DISHWASHER DETERGENT COMPOSITION

Ronald Lowell Jacobsen, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 1, 1976, Ser. No. 728,579
Int. Cl.[2] C11D *7/56*
U.S. Cl. 252—99 **6 Claims**

1. An automatic dishwashing composition consisting essentially of:

(a) from about 10 to about 90% by weight of alkaline detergency builders selected from the group consisting of sodium and potassium, orthophosphates, pyrophosphates, tripolyphosphates, carbonates, bicarbonates, hydroxides, silicates, water insoluble aluminosilicates, citrates, nitrilotriacetates, ethylenediamintetraacetates, oxydisuccinates, and mellitates;

(b) from 0 to about 90% by weight of an inert filler material selected from the group consisting of sodium sulfate, potassium sulfate, and starch;

(c) from 0 to about 10% by weight of chlorine-yielding bleach on an anhydrous basis selected from the group

consisting of sodium and potassium dichlorocyanurates and chlorinated trisodium phosphate;

(d) from about 0.1 to about 5% by weight of sodium or potassium random alkyl phosphonate wherein the alkyl chain contains from about 10 to 24 carbon atoms;

(e) from about 1 to about 15% by weight of a surfactant selected from the group consisting of a condensation product of fatty alcohol containing from 14 to 15 carbon atoms and from about 8 to 10 moles of ethylene oxide per mole of alcohol; condensation product of fatty alcohol containing from 12 to 13 carbon atoms with from about 6 to about 12 moles of ethylene oxide per mole of alcohol; and mixtures thereof;

(f) up to about 60% by weight water or low molecular weight water-soluble organic solvent, which is a short chain alcohol containing from about 1 to about 4 carbon atoms the pH of the composition at usage concentrations being from 8.5 to about 11 said automatic dishwashing composition being prepared by a process wherein components (d) and (e) are thoroughly premixed prior to adding these ingredients to the remainder of the composition.

4,105,574

PROCESS FOR FORMULATING A NON-CAUSTIC OVEN CLEANER WHICH WILL REMOVE PYROLYZED FAT EFFICACIOUSLY

Vincent Culmone, Passaic, and Thaddeus J. Kaniecki, Pompton Plains, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 543,844, Jan. 24, 1975, abandoned. This application May 10, 1976, Ser. No. 685,037
Int. Cl.[2] B08B *3/08*; C11D *3/12, 3/14, 3/20*
U.S. Cl. 252—154 2 Claims

1. A non-caustic alkaline, water-based oven cleaner composition capable of removing substantially all of baked on organic matter, said composition consisting essentially by weight, of about 0.3 to 5 percent of a synthetic, hydrous sodium magnesium silicate of the following composition: 57.4% SiO_2, 25.4% MgO, 0.95%Li_2O, 2.78% Na_2O, 0.04% Fe_2O_3, 0.26% Al_2O_3, 0.05% CaO, 0.4% SO_3, 0.3% CO_2, 5% H_2O; about 5 to 15 percent monoethanolamine, about 5 to 15 percent of an etherfied alkylene glycol solvent, about 1 to 5 percent of at least one anionic surfactant and about 0.5 to 5 percent of at least one nonionic surfactant, the balance being water, said composition being capable of forming a stable foam barrier on the surface to be cleaned, whereby there is substantially no flow of said cleaner on vertical surfaces.

4,105,575

PARTIAL RESOLUTION OF PENTAERYTHRITOL WASTE LIQUORS

Paul Eugene Eckler, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Oct. 12, 1976, Ser. No. 731,191
Int. Cl.[2] C07C *31/24*
U.S. Cl. 252—182 7 Claims

1. A method for partially resolving the components of a pentaerythritol waste liquor which contains pentaerythritol, polypentaerythritols, organic syrups, water and is substantially saturated with an alkali metal formate, comprising the steps of:

acidifying the waste liquor with an acid selected from the group consisting of sulfuric acid, phosphoric acid, hydrochloric acid, and nitric acid at a concentration of from about 90% to about 125% of an amount equivalent to the alkali metal formate, thereby converting the alkali metal formate to formic acid and a partially precipitated alkali metal salt;

adding to the acidified waste liquor a lower organic alcohol of from 1 to about 3 carbon atoms in an amount sufficient to react with the formic acid to form a formate ester and to precipitate substantially all of the alkali metal salt which was not precipitated in the acidification step; thereby forming an alcoholic waste liquor;

removing the formate ester from the alcoholic waste liquor by distillation to form a formate-free waste liquor; and

removing the precipitated alkali metal salt from the formate-free waste liquor.

4,105,576

SPILL CONTROL COMPOSITION AND USE THEREOF

James W. Seidenberger, Bethlehem, Pa., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Feb. 4, 1977, Ser. No. 765,798
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—190 6 Claims

1. An essentially homogeneous graular composition useful for the control and cleanup of liquid caustic spills comprising: from about 51.0 to about 81.0% by weight citric acid, about 12.0 to about 21.0% by weight expanded perlite, about 12.0 to about 12.0% by weight flour, about 1.2 to about 2.1% by weight fumed silica, about 0.01 to about 0.50% by weight of a pH indicator changing color in the range of about pH 6.0 to 8.0 and about 1.0 to about 3.0% by weight water and wherein the flour is selected from the group consisting of wheat, gluten, rye, barley, oat, arrowroot and tapioca flour.

4,105,577

FILTER GLASS

Toshiharu Yamashita, Hachioji, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Dec. 2, 1977, Ser. No. 856,895
Claims priority, application Japan, Dec. 2, 1976, 51/145150
Int. Cl.[2] C03C *3/16, 3/30*; F21V *9/08*; G02B *5/22*
U.S. Cl. 252—300 1 Claim

1. A filter glass which absorbs light of wavelengths in the range of about 400 to about 500 mμ when NiO is present alone and which additionally absorbs light of wavelengths in the range of about 400 to about 500 mμ and about 600 to about 700 mμ when both NiO and CuO are present, consisting essentially of

(a) 100 parts by weight of a base glass consisting of, by weight, 65 to 85% of P_2O_5; 3 to 10% of Al_2O_3; 0 to 18% of MgO, 0 to 25% of CaO, 0 to 30% of ZnO, with the total proportion of MgO + CaO + ZnO being 10 to 30%; 0 to 15% of SrO and/or BaO; 0 to 10% of PbO; 0 to 10% of at least one of Li_2O, Na_2O and K_2O; and 0 to 5% of B_2O_3, ZrO_2, TiO_2 or La_2O_3;

(b) 0.01 to 1.0 part by weight of NiO; and

(c) 0 to 2.0 parts by weight of CuO.

4,105,578

ORGANOPHILIC CLAY HAVING ENHANCED DISPERSIBILITY

Claude Malcolm Finlayson, and John W. Jordan, both of Houston, Tex., assignors to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 749,323, Dec. 10, 1976, which is a continuation-in-part of Ser. No. 573,967, May 2, 1975, abandoned. This application Feb. 23, 1977, Ser. No. 771,099
Int. Cl.[2] B01J *13/00*
U.S. Cl. 252—316 5 Claims

1. An organophilic clay gellant having enhanced dispersibility in organic systems and capable of increasing the viscosity of a liquid organic system without the addition of a polar organic dispersant, comprising the reaction product of a methyl benzyl dialkyl ammonium compound, wherein the compound contains 20 to 35% alkyl groups having 16 carbon atoms and 60 to 75% alkyl groups having 18 carbon atoms, and a smectite-type clay having a cation exchange capacity of at least 75 milliequivalents per 100 grams of said clay, and wherein the amount of said ammonium compound is from 100 to 120 milliequivalents per 100 grams of said clay, 100% active clay basis.

4,105,579
PROCESS FOR PRODUCING PHARMACEUTICAL GRADE ALUMINUM HYDROXIDE GELS

Green Bateman Glascock, Lewes, Del., assignor to Barcroft Company, Lewes, Del.

Filed Mar. 4, 1976, Ser. No. 663,652
Int. Cl.[2] B01J *13/00*
U.S. Cl. 252—317 5 Claims

1. A process for producing aluminum hydroxide gels which comprises combining water, a water soluble salt of aluminum selected from the group consisting of aluminum chloride, aluminum sulfate and aluminum nitrate, and a water insoluble alkaline earth carbonate under heterogeneous reaction conditions while maintaining a reaction pH between 4.7 and 5.5 and isolating the aluminum hydroxide gel.

4,105,580
POLYGLYCEROL NON-IONIC SURFACE ACTIVE AGENTS AND PROCESS FOR PREPARING THE SAME FROM CRUDE GLYCIDOL

Henri Sebag, Paris, and Guy Vanlerberghe, Commune de Villevaude, both of France, assignors to L'Oreal, Paris, France

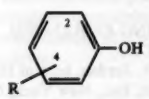
Filed Oct. 20, 1976, Ser. No. 734,367
Claims priority, application Luxembourg, Oct. 23, 1975, 73632
Int. Cl.[2] B01F *17/22*
U.S. Cl. 252—351 10 Claims

1. A two stage process for preparing a water-soluble non-ionic surface active agent comprising, in a first stage (a) reacting glycerol monochlorohydrin with a strong base in the presence of a solvent at a temperature between 10° and 35° C for a period ranging from 15 minutes to 1 hour to produce a solution of crude glycidol; (b) neutralizing the said solution of crude glycidol with a strong acid whereby a salt is formed, separating a major portion of the thus formed salt from the said solution of crude glycidol, the said solution of crude glycidol containing from 0 to 0.1 mole of unreacted glycerol monochlorohydrin per mole of glycidol present in said solution; and in a second stage (c) condensing the said solution of crude glycidol resulting from step (b) with an organic compound containing an active hydrogen in the presence of an effective amount of an alkaline catalyst to produce said non-ionic surface active agent, said organic compound being selected from the group consisting of

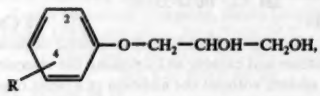
(1) alkyl mercaptan having the formula R_1SH wherein R_1 represents alkyl having from 8 to 18 carbon atoms,

(2) glycerol alkyl thioether having the formula $R_1—S—CH_2—CHOH—CH_2OH$ wherein R_1 represents alkyl having from 8 to 18 carbon atoms,

(3) alkyl phenol having the formula



or glycerol alkyl phenyl ether having the formula



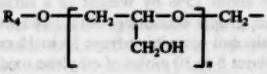
wherein one of the carbon atoms in the 2- and 4- positions is linked to R wherein R is alkyl having from 8 to 18 carbon atoms and the other of said carbon atoms is linked to a member selected from the group consisting of alkyl having from 1–8 carbon atoms and hydrogen,

(4) 1,2-α-diol of the formula $R_2—CHOH—CH_2OH$ wherein R_2 is selected from the group consisting of

(i) straight chain alkyl having 6–16 carbon atoms or a mixture thereof,

(ii) $R_3—CHOH—S—CH_2—$,

(iii) $R_3—CHOH—CH_2—O—CH_2—$,



(v) a mixture of (ii) to (iv),

wherein R_3 represents alkyl having 8–18 carbon atoms or a mixture thereof, R_4 represents a member selected from the group consisting of alkyl having 8–18 carbon atoms or a mixture thereof and a mixture of aliphatic and alicyclic radicals having up to 30 carbon atoms and being derived from lanolin alcohols, and *n* represents a whole or decimal number from 0 to 2, said number representing a definite value or a statistical average value, and

(5) fatty acid diglycolamide having the formula $R_5—CONH—CH_2—CH_2—O—CH_2—CH_2OH$ wherein R_5 represents alkyl or alkenyl having 7–17 carbon atoms or a mixture thereof.

4,105,581
CORROSION INHIBITOR

David R. Sexsmith, Kinnelon, N.J., assignor to Drew Chemical Corporation, Boonton, N.J.

Filed Feb. 18, 1977, Ser. No. 769,918
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—389 A 14 Claims

1. In a corrosion inhibitor including a corrosion inhibiting amount of (a) a water soluble polyphosphate or alkali metal phosphate and (b) a water soluble phosphonate or salt thereof, the improvement comprising:

said composition further including a corrosion inhibiting amount of (c) a polymer selected from the group consisting of the homopolymers of maleic acid and maleic anhydride and mixtures thereof.

4,105,582
COMPOSITION FOR THE CONTROL OF CORROSION AND FOAMING IN THE ACRYLONITRILE PLANTS

Yoshiharu Oguro, Tsu, Japan, assignor to Nalco-Hakuto Chemical Company, Tokyo, Japan

Filed Jun. 23, 1977, Ser. No. 809,480
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—392 2 Claims

1. A method for the inhibition of corrosion in acrylonitrile production systems of the type wherein propylene is reacted with ammonia in the presence of oxygen and a catalyst which comprises adding to the process stream after it has made contact with the catalyst from 1–100ppm of a composition comprising:

A. From 1–40% by weight water;

B. From 1–40% by weight of an ethylene glycol monoalkylether;

C. From 5–50% by weight of a polypropylene glycol having a molecular weight of from 2,500 to 5,000; and,

D. From 10–55% by weight of a glyoxalidine salt of a dicarboxylic acid in which the glyoxalidine portion of the molecule is obtained by reacting an aliphatic polyamine from the group consisting of amino ethanol amine, diethylene triamine, and triethylene tetraamine with a fatty acid containing 6–22 carbon atoms.

4,105,583

THERMOCHROMIC PAINT FOR USE ON PLASTIC SUBSTRATES

Leon C. Glover, Los Altos, and Eugene F. Lopez, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 460,124, Apr. 11, 1974, abandoned. This application Nov. 28, 1975, Ser. No. 635,951

Int. Cl.[2] C09K *3/00*; G01K *11/12*; C09D *5/08, 5/26*

U.S. Cl. 252—408 9 Claims

1. In a thermochromic paint for use on a plastic substrate and containing a thermochromic pigment, said pigment being a metallic compound and being dispersed in a suitable binder, the improvement being the addition to the paint of a non-thermochromic compound in amounts effective to inhibit degradation of the substrate by the thermochromic pigment, said non-thermochromic compound being selected from the group consisting of the sulfates, hydrated sulfates and nitrides of boron, aluminum, tin, lead, arsenic, antimony, bismuth, zinc and phosphorus; the sulfides and hydrated sulfides of boron, aluminum, bismuth and phosphorus; the oxides and hydrated oxides of boron, arsenic, and antimony; the salts, organic derivatives and free acids of the oxyanions of boron, arsenic, and antimony; and the oxides, and salts and organic derivatives of the oxyanions of phosphorus.

4,105,584

PROCESS FOR PREPARING A DISPERSION

Håkan Nils Norbäck, and Benkt Göran Rurik Asp, both of Stockholm, Sweden, assignors to KemaNobel AB, Stockholm, Sweden

Filed Jul. 13, 1976, Ser. No. 704,868

Claims priority, application Sweden, Jul. 29, 1975, 7508603

Int. Cl.[2] B01J *31/02, 27/20*

U.S. Cl. 252—426 3 Claims

1. A process for the preparation of stable aqueous dispersions of solid peroxydicarbonates having unchanged active peroxide content, characterized in that a slurry of water, dispersing agent and peroxydicarbonate is dispersed in an ultrasonic homogenizer, said solid peroxydicarbonate being selected from the group consisting of dialkyl peroxydicarbonates and cycloalkyl peroxydicarbonates.

4,105,585

POLYMERISATION CATALYST

Ian Alastair Matheson, Edinburgh, Scotland, assignor to BP Chemicals Limited, London, England

Filed May 18, 1977, Ser. No. 798,178

Claims priority, application United Kingdom, May 24, 1976, 21332/76

Int. Cl.[2] C08F *4/64, 4/66*

U.S. Cl. 252—429 B 9 Claims

1. A process for making a Ziegler catalyst comprising reacting together magnesium metal and a titanium compound having the general formula $Ti(OR)_{4-n}X_n$ wherein n has a value from 4 to 1 inclusive, X is halogen and R is a hydrocarbon group, in the presence of an aliphatic alcohol having 1 to 6 carbon atoms, said titanium compound being employed in an amount of from about 3 to 0.5 moles per gramme atom of magnesium metal and said alcohol being present in an amount of from about 0.1 to 5 moles per gramme atom of magnesium metal.

4,105,586

OXIDATION CATALYSTS AND PROCESS FOR PREPARING ANHYDRIDE FROM ALKANES

Ralph O. Kerr, Houston, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Filed Feb. 10, 1977, Ser. No. 767,499

The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.

Int. Cl.[2] B01J *27/14*; C07D *307/60*

U.S. Cl. 252—437 7 Claims

1. A catalyst composition for use in the partial oxidation of C_4 to C_{10} alkane hydrocarbons to anhydride consisting of vanadium, phosphorus, oxygen and a modifying component consisting of

I. (a) the elements Nb, Cu, Mo, Ni, Co and Cr, and

(b) one or more elements selected from the group consisting of Y, Sm, Tb and Eu, or

II. (a) the elements Nb, Cu, Mo, Ni, Co and Cr,

(b) one or more of the elements selected from the group consisting of Ce, Nd, Ba, Hf, U, Ru, Re, Li and Mg, and

(c) one or more elements selected from the group consisting of Y, Sm, Tb and Eu,

wherein the atomic ratio of vanadium:phosphorus:Nb:Cu:Mo:Ni:Co:Ce:Nd:Cr:Ba:Hf:U:Ru:Re:Li:Mg:Y:Sm:Tb:Eu is 1:0.90 to 1.3:0.001 to 0.125:0.022 to 0.201: 0.0025 to 0.40: 0.0022 to 0.045: 0.004 to 0.066: 0.0054 to 0.20: 0.0022 to 0.20: 0.0003 to 0.003: 0.0023 to 0.0585:0.0023 to 0.0409:0.0033 to 0.0993: 0.0002 to 0.02015: 0.0002 to 0.0074: 0.0072 to 0.179:0.0088 to 0.222: 0.0001 to 0.02: 0.0001 to 0.02: 0.0001 to 0.02: 0.0001 to 0.02, respectively, the total atomic ratio of NB, Cu, Mo, Ni, Co, Ce, Nd, Cr, Ba, Hf, U, Ru, Re, Li, Mg, Y, Sm, Tb and Eu being in the range of 0.033 to 0.4.

4,105,587

PROCESS FOR PRODUCING A PARTICLE PACK COMPOSITION COMPRISING ALUMINA AND THE RESULTING ATTRITION RESISTANT COMPOSITION

Donald W. Blakely, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 16, 1977, Ser. No. 852,016

Int. Cl.[2] B01J *21/04, 23/84, 27/04, 27/10*

U.S. Cl. 252—439 11 Claims

1. In a process for producing a rigidly interconnected pack of pulverable particles having average diameters in the range below about 1.3 mm and comprising aluminum oxide by steps, including (1) drying a dough-like mixture comprising said particles, water and an organic hydrocolloid-forming compound and (2) calcining said dried mixture, the improvement comprising, prior to said calcining, dry steaming said dough-like mixture and/or said dried mixture at a temperature in the range of from about 100° C to 175° C for a period in the range of from about 0.3 to 24 hours, wherein the resulting rigidly interconnected particle pack, relative to a comparable particle pack produced without said steaming, exhibits a substantially improved attrition resistance.

4,105,588

PREPARATION OF COPPER AND SILVER PARTICLES FOR ETHYLENE PURIFICATION

Agostino Balducci, San Donato Milanese; Margherita Corbellini, Milan; Vittorio Mormino, San Donato Milanese; Bruno Notari, San Donato Milanese, and Luigi Rivola, San Donato Milanese, all of Italy, assignors to Snam Progetti, S.p.A., San Donato Milanese, Italy

Continuation of Ser. No. 574,910, May 6, 1975, abandoned, which is a division of Ser. No. 422,743, Dec. 7, 1973, abandoned. This application Jun. 7, 1977, Ser. No. 804,382

Claims priority, application Italy, Dec. 20, 1972, 33278 A/72

Int. Cl.[2] B01J *29/00, 29/06, 21/00*

U.S. Cl. 252—454 3 Claims

1. The process of preparing a contact material adapted for use in the purification of ethylene said contact material consist-

ing of from 1 to 50% by weight of particles of a finely divided elemental metal selected from Cu and Ag homogeneously dispersed on a carrier selected from the group consisting of zeolites, spheroidal alumina, silica gel, Kieselguhr and colloidal silica, which comprises forming a solution or suspension of a reducible compound of said metal, mixing said carrier therewith, atomizing said mixture at a temperature of from 100° to 500° C so that particles having sizes of from 1 to 250 μ are produced, granulating said particles, and then reducing said compound of said metal to said elemental metal.

4,105,589

HYDRODESULFURIZATION CATALYST

William R. Moser, Wayland, Mass., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 646,632, Jan. 5, 1976. This application Dec. 16, 1976, Ser. No. 751,400

Int. Cl.[2] B01J *23/10, 23/76, 23/72, 27/04*

U.S. Cl. 252—462 **10 Claims**

1. A hydrodesulfurization catalyst consisting essentially of a hydrogenation component and a refractory oxide support, said hydrogenation component consisting essentially of from about 1 to about 15 weight percent of a rare earth metal component, said rare earth metal component being selected from the group consisting of at least one elemental metal selected from the group having atomic numbers 58 to 71, (a) metal oxides selected from the group consisting of oxides of Pr, Nb, Sm, Eu, Dy, Er and Yb or a metal sulfide of a rare earth metal selected from the group having atomic numbers 58 to 71 and from about 1 to about 5 weight percent of a non-rare earth metal component, said non-rare earth metal component being selected from the group consisting of at least one elemental metal, metal oxide and metal sulfide of a non-rare earth metal selected from the group consisting of Group IB, Group IIB, indium, Group VIB, and iron, cobalt and nickel of Group VIII of the Periodic Table of Elements.

4,105,590

CATALYSTS AND THE PROCESS FOR THEIR PRODUCTION

Edgar Koberstein, Alzenau, and Eduard Lakatos, Rheinfelden, both of Germany, assignors to Deutsche Goldund Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Continuation of Ser. No. 610,033, Sep. 3, 1975, abandoned, which is a continuation of Ser. No. 344,459, Mar. 23, 1973, abandoned. This application Nov. 22, 1976, Ser. No. 744,079

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1972, 2214604

Int. Cl.[2] B01J *21/04, 23/60, 23/64, 23/74*

U.S. Cl. 252—464 **48 Claims**

1. In an improved process for preparing a catalyst, said process comprising preparing a homogeneous, particulate mixture comprising catalytically active eta- and gamma- aluminum oxide and more than 50% by weight of at least two metal oxides, one of said metal oxides being chromium oxide and the other metal oxide being selected from the group consisting of titanium oxide, vanadium oxide, manganese oxide, iron oxide, cobalt oxide, nickel oxide, copper oxide and zinc oxide, wherein the improvement comprises impregnating said mixture with a solution of at least one salt of a noble metal selected from the group consisting of palladium, platinum, rhodium, iridium and ruthenium, drying the resulting impregnated composition, and rendering the noble metal impregnant catalytically active by: (a) thermal decomposition in air, (b) oxidation, or (c) reduction; wherein said catalyst contains less than 2 weight percent noble metal component.

4,105,591

METHOD OF PREPARING AND FILTERING COPRECIPITATED NICKEL-ALUMINA CATALYSTS

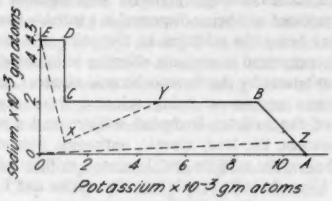
Reginald George Sinclair Banks, and Alan Williams, both of Solihull, England, assignors to British Gas Corporation, England

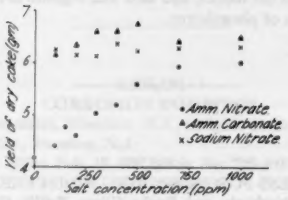
Filed Jul. 12, 1976, Ser. No. 704,410

Claims priority, application United Kingdom, Sep. 29, 1975, 39724/75

Int. Cl.[2] B01J *21/04, 23/78, 37/02;* C01B *2/14*

U.S. Cl. 252—466 J **11 Claims**





1. In a process for the production of nickel-alumina coprecipitated catalyst composition which process comprises producing a slurry of mixed precipitates of water insoluble compounds of nickel and aluminium by coprecipitation from water solution utilizing sodium or potassium precipitants in the essential absence of chemical species having a deleterious effect upon the performance of the catalyst, then washing and filtering the slurry a plurality of times, drying the finally filtered slurry to produce a filter cake and thereafter calcining the cake, the improvement comprising facilitating the washing and filtering of the slurry when the same contains very low levels of sodium and potassium by, during the last washing and filtering operations at least, using as a washing liquor a mixture of water and about 100 ppm of a filtering aid selected from the group consisting of sodium or potassium carbonate or nitrate or about 200 ppm of a filtering aid consisting of ammonium carbonate.

4,105,592

LIQUID DETERGENT COMPOSITIONS

Jerome H. Collins, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 481,726, Jun. 21, 1974, abandoned. This application Nov. 6, 1974, Ser. No. 521,414

The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.

Int. Cl.[2] C11D *1/83, 3/26*

U.S. Cl. 252—545 **11 Claims**

1. A liquid detergent composition consisting essentially of:

(a) from about 20% to about 50% by weight of a nonionic surfactant produced by the condensation of from about 2 moles to about 12 moles of ethylene oxide with one mole of a C_8 to C_{12} alcohol, said nonionic surfactant being characterized by an HLB of from about 8 to about 15, or mixtures thereof;

(b) an anionic surfactant which is a mixture of an alkanolamine and an alkali metal salt of an alkyl benzene sulfonic

acid wherein the alkyl group contains from about 9 to about 15 carbon atoms, and wherein said alkanolamine is selected from the group consisting of mono-, di- and triethanolamines, and said alkali metal is selected from the group consisting of sodium and potassium at a weight ratio of nonionic surfactant to anionic surfactant of from about 1.8:1 to about 8:1 based on the free acid form of the anionic surfactant;

(c) at least 1% by weight of free alkanolamine selected from the group consisting of mono-, di- and triethanolamines;

(d) from about 0.15% to about 2% by weight of a C_{10}-C_{22} fatty acid, or mixtures thereof;

(e) from about 1.0% to about 2.5% of an alkali metal base selected from the group consisting of sodium and potassium hydroxides; and

(f) the balance being water or a water-alcohol carrier liquid wherein said alcohol is a monohydric alcohol containing from 1 to about 5 carbon atoms.

4,105,593

METHOD OF RECLAIMING WASTE SHEET FLOORING

Stavros C. Stavrinou, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Jul. 8, 1977, Ser. No. 814,129
Int. Cl.[2] C08J *11/04*
U.S. Cl. 260—2.3 2 Claims

1. A process for recovering scrap sheet floor covering material which is composed of at least a felted fibrous backing cured to a non-fibrous resin surface, the steps comprise:

a. dicing said scrap sheet floor covering to reduce it to small pieces,

b. masticating the sheet floor covering pieces in the presence of a plasticizer with a high shear stress blender, moving the mix in the blender not under pressure in a continuous circular path due to centrifugal action, and breaking up the pieces of floor covering and dispersing all its ingredients, and

c. discharging the resulting mix from the blender for use as part of a new mix which can be formed into a floor covering product.

4,105,594

HIGHLY FILLED POLYUREA FOAMS

Dieter Dieterich, Leverkusen, and Peter Markusch, Cologne, both of Germany, assignors to Bayer Aktiengellschaft, Leverkusen, Germany

Filed May 18, 1976, Ser. No. 687,579
Claims priority, application Fed. Rep. of Germany, May 31, 1975, 2524191
Int. Cl.[2] C08G *18/10, 18/14;* C08K *3/36*
U.S. Cl. 521—100 8 Claims

1. A process for the production of highly filled hydrophobic, hard polyurea foams with gross densities of from 10 to 100 Kg/M^3 comprising reacting

(a) a polyisocyanate, said polyisocyanate being a liquid water insoluble polyisocyanate, free from ionic groups or groups which are capable of forming ionic groups during the process, said polyisocyanate having a viscosity of more than 200 cP at 25° C, a functionality of greater than 2.1, and an NCO-content of from 20 to 32% by weight, said polyisocyanate being selected from the group consisting of

(i) phosgenation products of condensates of aniline or anilines alkyl substituted on the nucleus with aldehydes or ketones,

(ii) solutions of distillation residues accumulating during the production of tolylene diisocyanate, diphenylmethane diisocyanate, or hexamethylene diisocyanate, in monomeric polyisocyanates or in organic solvents,

(iii) mixtures of said distillation residues,

(iv) modified polyisocyanates containing carbodiimide groups, allophanate groups, isocyanurate groups, urea groups, or biuret groups, said modified polyisocyanate prepared by modifying polyisocyanates thermally or catalytically by air, water, urethanes, alcohols, amides or amines,

(v) semi-prepolymers obtained by reacting polyisocyanates (i) through (iv) with glycols or polyols, said semi-prepolymer polyisocyanates containing less than 10% by weight of polyols;

(b) a aqueous suspension of inert minerals or hydraulic binders, said suspension having a solids content of from 30 to 80% by weight, at least 50% by weight of the suspended fillers having the particle size of less than 50 microns;

(c) in the presence of a polyether/polysiloxane foam stabilizer, and in the presence of a tertiary amine catalyst, the weight ratio of component (b) to component (a) being between 1:2 and 6:1, the pH value of the aqueous suspension, together with the tertiary amine catalyst, being above 8.

4,105,595

PROCESS FOR THE PRODUCTION OF HIGHLY ELASTIC POLYURETHANE FOAMS

Karl Heinz Eisenmann, Bergisch-Neukirchen, and Karl Heinz Broch, Leichlingen, both Germany, assignors to Bayer Aktiengellschaft, Leverkusen, Germany

Continuation of Ser. No. 610,196, Sep. 4, 1975, abandoned. This application Jun. 6, 1977, Ser. No. 803,717
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1974, 2444331
Int. Cl.[2] C08G *18/14*
U.S. Cl. 521—159 3 Claims

1. In the process for the production of cold hardening polyurethane foams by the reaction of modified polyisocyanates with polyethers containing predominant amounts of primary OH groups and molecular weights in the range from 400 to 10,000 in the presence of water and/or organic blowing agents and optionally catalysts, foam stabilizers, cross-linking agents with active hydrogen atoms and molecular weights in the range from 30 to 400, and other additives, the improvement wherein the mixing head used for the mixing of the foam reactants is preceded by another mixing head for mixing the starting components for said modified polyisocyanates and the catalyst or catalyst mixtures which are necessary for the production of such modified polyisocyanates, and by a reaction zone for carrying out the production of the modified polyisocyanates within a time of from 0.1 seconds to 20 minutes befor forming.

4,105,596

PRODUCTION OF EXPANDABLE BEADS FROM THE THERMOPLASTIC MATERIALS

Jorgen Petersen, Sundsvall, Sweden, assignor to KemaNobel AB, Stockholm, Sweden

Filed Dec. 6, 1977, Ser. No. 858,122
Claims priority, application Sweden, Dec. 10, 1976, 7613937
Int. Cl.[2] E08J *9/20*
U.S. Cl. 521—56 4 Claims

1. In the known process for preparing expandable thermoplastic beads by introducing an aqueous suspension of at least one unsaturated monomer and a blowing agent into a polymerization vessel under polymerization conditions and carrying out polymerization, the improvement which comprises keeping the entire volume of the polymerization vessel filled with liquid throughout the polymerization so as to leave no space for the accumulation of gas in the polymerization vessel.

4,105,597

POLYURETHANE FOAM FROM AN OXYALKYLATED PRODUCT

Arthur L. Austin, Southgate; William W. Levis, Jr., Wyandotte; Louis C. Pizzini, Trenton, and Robert J. Hartman, Southgate, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 590,332, Jun. 25, 1975, and Ser. No. 590,333, Jun. 25, 1975, Pat. No. 4,052,345, each is a division of Ser. No. 425,524, Dec. 17, 1973, Pat. No. 3,957,922. This application Aug. 15, 1977, Ser. No. 824,279

Int. Cl.[2] C08G *18/14, 18/48, 18/50*

U.S. Cl. 521—159 7 Claims

1. A polyurethane foam system which comprises, based on the total weight of ingredients, two components, the first component comprising

(A) 20 to about 100 parts of an oxyalkylation polyol product prepared by the process of

(1) providing a reaction mixture containing

(a) a phenol, at least in an amount sufficient to form a complex with aluminum or iron substances in the mixture,

(b) a non-phenolic active hydrogen compound having from 2 to 8 active hydrogens per molecule and having an average molecular weight below about 10,000, and

(c) a substance containing aluminum or iron which will form a complex with the phenol (a), in an amount sufficient to form a complex with the phenol (a),

(2) heating the mixture to a temperature in the range of from about 80° to about 250° C., and

(3) oxyalkylating the heated mixture by adding thereto sufficient alkylene oxide having from 2 to 12 carbon atoms to form an oxyalkylated polyol product,

(C) 0.2 to about 2 parts of a polymerization catalyst,

(D) 0.15 to about 3 parts of a wetting agent, and

(E) 5 to about 30 parts of a blowing agent, the second (B) components comprising 40 to about 60 parts of a polyarylpolyalkylene polyisocyanate having a functionality of about 2.2 to about 3.3 or of an isocyanate-terminated prepolymer derived from the reaction of a stoichiometric excess of said polyarylpolyalkylene polyisocyanate with said oxyalkylated polyol; wherein the catalyst residues from the production of polyol (A) are not removed prior to use of said polyol in said foam system.

4,105,598

CELL SPECIFIC, VARIABLE DENSITY, POLYMER MICROSPHERES

Shiao-Ping S. Yen; Alan Rembaum, both of Altadena, and Robert S. Molday, Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 634,929, Nov. 24, 1975. This application Feb. 3, 1977, Ser. No. 765,453

Int. Cl.[2] C08F *226/00, 218/00*

U.S. Cl. 521—53 13 Claims

1. A method of separating of a specific conjugatible protein from a mixture comprising the steps of:

covalently binding a conjugate of the specific protein to polymeric beads having an average diameter below 5 microns, having a density less than 1.5 g/cc or greater than 1.30 g/cc and comprising the cross-linked product of an ethylenically unsaturated monomer mixture including at least 10% by weight of a first ethylenically monounsaturated acrylic monomer containing at least one substituent selected from hydroxyl, carboxyl or amino, at least 25% by weight of a second ethylenically monounsaturated comonomer having a density differing from the first monomer by at least 15% selected from vinyl fluorides, vinyl ketones, vinyl ethers, vinyl iodides, vinyl bromides and vinyl siloxanes, and 1–20% of a polyunsaturated cross-linking agent.

4,105,599

PROCESS FOR PRODUCING RIGID POLYURETHANE FOAM

Reishi Naka, and Toshikazu Narahara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 3, 1976, Ser. No. 654,914

Claims priority, application Japan, Feb. 21, 1975, 50-20987

Int. Cl.[2] C08G *18/14, 18/50*

U.S. Cl. 521—131 8 Claims

1. A process for producing a rigid polyurethane foam according to one-shot method which comprises reacting a polyol with a polyfunctional organic isocyanate, said polyol having a mixture having an OH number of 420 to 530 which comprises 35 to 65 parts by weight of a reaction product of sucrose with an alkylene oxide and 65 to 35 parts by weight of a reaction product of a trihydroxyalkylamine with an alkylene oxide, and said mixture being free from a phosphorus-containing polyol, in the presence of at least two foaming agents consisting of at least one fluorochlorinated hydrocarbon having 1 to 2 carbon atoms and 0.2 to 2 parts by weight of water per 100 parts by weight of said polyol to form a rigid polyurethane foam having a density of 0.025 gm/cm^3 or less.

4,105,600

NITROGEN CONTAINING CHEMICAL COMPOUNDS AND A PROCESS FOR MAKING POLYURETHANES WITH THE NEW COMPOUNDS AS A CATALYST

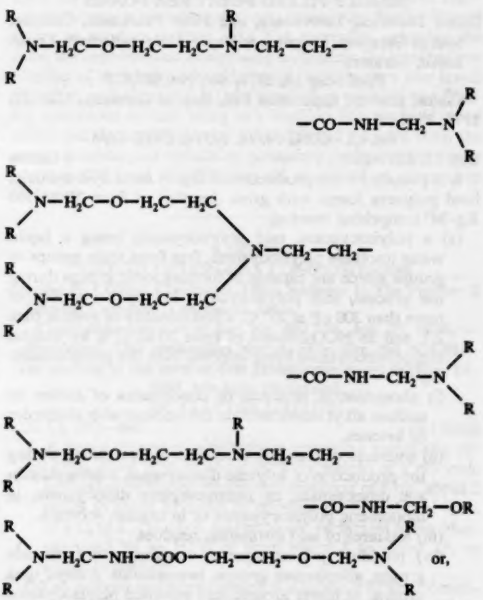
Erwin Müller, and Heinz Thomas, both of Leverkusen, Germany, assignors to Bayer Aktiengellschaft, Leverkusen, Germany

Continuation of Ser. No. 466,657, May 3, 1974, abandoned. This application Jan. 12, 1977, Ser. No. 758,536

Int. Cl.[2] C08G *18/18*

U.S. Cl. 521—129 8 Claims

1. In a process for making a polyurethane wherein an organic polyisocyanate is reacted with an organic compound having at least two reactive hydrogen atoms determinable by the Zerewitinoff method, the improvement which comprises including in the reaction mixture a compound having the formula:



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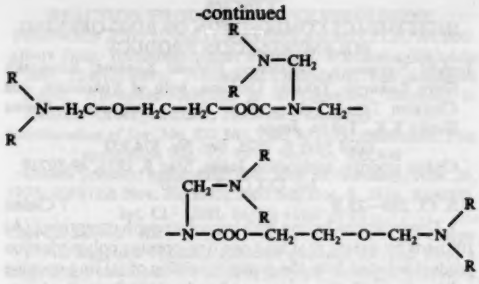


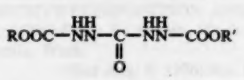
wherein R is an alkyl radical having up to six carbon atoms.

4,105,601
3,3'-CARBONYLBIS(CARBAZATES) AS BLOWING AGENTS

Byron Alexander Hunter, Woodbridge, and Franklin Herbert Barrows, Beacon Falls, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,673
Int. Cl.² C08J 9/10
U.S. Cl. 521—95 **9 Claims**

1. A method of making a gas-expanded polymeric material which comprises blending a carbonylbis(organocarbazate) having the general formula



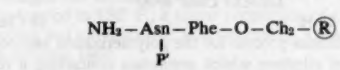
or dihydrates thereof wherein R and R' are the same or different and are C_1 to C_6 alkyl, C_5 to C_6 cycloalkyl, phenyl or benzyl, with gas-expandable polymeric material and heating the resultant blend to a temperature sufficiently to decompose said carbonylbis(organocarbazate).

4,105,602
SYNTHESIS OF PEPTIDES WITH PARATHYROID HORMONE ACTIVITY

Robert L. Colescott, Bourbonnais, Ill., and Geoffrey W. Tregear, Hawthorne, Australia, assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed Feb. 10, 1975, Ser. No. 548,718
Int. Cl.² C08L 37/00; C07C 103/52
U.S. Cl. 260—8 **9 Claims**

1. A resin peptide having the structure:



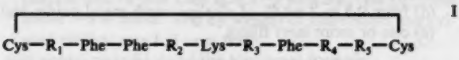
wherein:
R is an insoluble polystyrene resin; and
P' is hydrogen, xanthydryl or benzhydryl.

4,105,603
PEPTIDES WHICH EFFECT RELEASE OF HORMONES

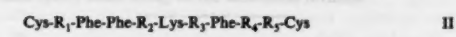
Wylie W. Vale, Jr.; Jean E. F. Rivier, and Marvin R. Brown, all of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Mar. 28, 1977, Ser. No. 781,580
Int. Cl.² C08L 37/00; C07C 103/52; A61K 37/00
U.S. Cl. 260—8 **7 Claims**

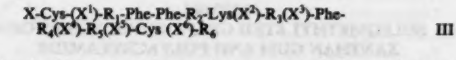
1. A peptide selected from those of the formulae:



I



II



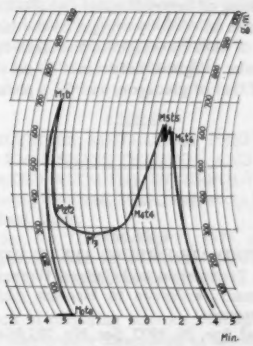
III

wherein R_1 is selected from the group consisting of Asn and desR_1; R_2 is selected from the group consisting of Trp and D-Trp; R_3 is selected from the group consisting of Phe and Thr; R_4 is selected from group consisting of Thr and desR_4; R_5 is selected from the group consisting of Ser, Phe and desR_5, provided that at least one of R_1, R_4 and R_5 is deleted; X is selected from the group consisting of H, and an alpha-amino protecting group; X^1 and X^6 are selected from the group consisting of H and a protecting group for Cys selected from S-p-methoxybenzyl, S-acetamidomethyl, S-trityl and S-benzyl; X^2 is selected from the group consisting of H and a side chain amino protecting group; X^3, X^4 and X^5 are selected from the group consisting of H and a hydroxyl protecting group selected from the group consisting of acetyl, benzoyl, tert-butyl, trityl, benzyl and benzyloxycarbonyl; with the proviso that at least one of X, X^1, X^2, X^3, X^4, X^5, and X^6 is other than hydrogen; and R_6 is selected from the group consisting of hydroxy, methoxy, and an anchoring bond used in solid phase synthesis linked to a solid resin support selected from the group consisting of —O—CH_2-polystyrene resin support and O—CH_2-benzylpolystyrene resin support.

4,105,604
MOULDING COMPOSITIONS CONTAINING A NOVOLAK PHENOLIC RESIN AND AN AMINE-BORIC ACID STABILIZER-CATALYST

Silvio Vargiu, Casatenovo (Como); Pier Luigi Manzoni, Codogno (Milan); Mario Bernasconi, Maleo (Milan), and Antonio Parodi, Monza (Milan), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 15, 1976, Ser. No. 750,933
Claims priority, application Italy, Dec. 19, 1975, 30494 A/75
Int. Cl.² C08L 1/02
U.S. Cl. 260—17.2 **25 Claims**



1. A thermosetting injection molding composition comprising:
(a) from 15 to 50 wt.% of Novolak phenolic resin;
(b) from 3 to 10 wt.% of hexamine;
(c) from 1 to 4 wt.% of a stabilizing-catalyzing mixture consisting of an amine selected from the group consisting of aliphatic compounds having two or more amino groups, aromatic compounds having one amino group linked to an aromatic ring and aromatic compounds having two or more amino groups linked to one or more aromatic rings, and orthoboric or metaboric acid, wherein the ratio between said amino groups and the number of

acid equivalents in said mixture is from 0.001:1 to 0.3:1; (d) from 0.5 to 2 wt.% of alkaline earth metal oxide; and (e) one or more inert fillers.

4,105,605

SULFOMETHYLATED GRAFT COPOLYMERS OF XANTHAN GUM AND POLYACRYLAMIDE

Ian W. Cottrell, Solana Beach, Calif.; Richard A. Empey, Okmulgee, Okla., and Joseph S. Racciato, San Diego, Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 21, 1976, Ser. No. 753,057
Int. Cl.[2] C08L 5/00
U.S. Cl. 260—17.4 GC 10 Claims

1. A water-soluble graft copolymer of xanthan gum and polyacrylamide containing from about 1 part by weight of xanthan gum to from about 0.3 to about 10 parts by weight of polyacrylamide wherein at least about 10% of the amide functions of the polyacrylamide portion of the copolymer are sulfomethylated.

4,105,606

ADHESIVE FOR THE MANUFACTURE OF PLYWOOD, PARTICLE BOARDS, FIBER BOARDS AND SIMILAR PRODUCTS

Kaj G. Forss, and Agneta G. M. Fuhrmann, both of Helsinki, Finland, assignors to Keskuslaboratorio-Centrallaboratorium Ab, Finland

Continuation-in-part of Ser. No. 604,114, Aug. 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 395,901, Sep. 10, 1973, abandoned. This application Jul. 14, 1977, Ser. No. 815,673
Claims priority, application Finland, Sep. 14, 1972, 2527/72; Jan. 28, 1975, 752289; Jan. 28, 1975, 751/74
Int. Cl.[2] C08L 97/00, 61/14
U.S. Cl. 260—17.5 19 Claims

1. An adhesive for the manufacture of wood products, comprising the combination of (a) a lignin derivative selected from the group consisting of lignosulfonates and alkali salts of alkali lignins, a minimum of 65% by weight of the lignosulfonates and a minimum of 40% by weight of the alkali lignins having a relative molecular weight as determined by gel chromatography in excess of that of glucagon, and (b) a phenol formaldehyde resin.

4,105,607

MODIFIED AIR-DRYING ALKYD RESINS

Hannes Fischer, Taunusstein, and Gerhard Werner, Glashutten, both of Germany, assignors to Hoechst Aktiengellschaft, Frankfurt, Germany

Filed Apr. 28, 1977, Ser. No. 792,054
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1976, 2618629
Int. Cl.[2] C09D 3/56, 3/66, 5/08
U.S. Cl. 260—22 CB 12 Claims

1. A modified air-drying alkyl resin based on a polycarboxylic acid, a polyhydric alcohol, and a monocarboxylic acid having at least 7 carbon atoms, and additionally at least one chemically incorporated copolymer of (A) dicyclopentadiene or an alkyl derivative thereof and (B) at least one unsaturated compound selected from the group consisting of (B1) an olefinically unsaturated carboxylic acid and a derivative thereof, and (B2) an olefinically unsaturated alcohol,

4,105,608

HIGH IMPACT COMPOSITION OF RING-OPENING POLYMERIZATION PRODUCT

Junichi Nakamura, Yokohama; Hiroshi Konuma, Kawasaki; Shiro Kokuryo; Takashi Ueshima, both of Yokohama, and Chutatsu Tsuge, Tokyo, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed May 6, 1975, Ser. No. 574,932
Claims priority, application Japan, May 8, 1974, 49-50219
Int. Cl.[2] C08L 91/00
U.S. Cl. 260—23 R 7 Claims

1. Compositions having high impact strength comprising (A) 100 parts by weight of at least one ring-opening polymerization product selected from the group consisting of (a) ring-opening polymerization homopolymers of norbornene derivatives containing at least one nitrile group or substituent including a nitrile group, (b) ring-opening polymerization homopolymers of norbornene derivatives containing at least one ester group or substituent including an ester group, (c) ring-opening polymerization copolymers of combination of said norbornene derivatives, and (d) other ring-opening polymerization copolymers of any of said norbornene derivatives and 50 mol% at most of unsaturated cyclic compounds; and(B) 0.05 to 10 parts by weight of metal salts of fatty acids selected from the group consisting of metal salts of saturated mono- and dibasic fatty acids containing 6 to 20 carbon atoms, metal salts of unsaturated fatty acids containing 11 to 24 carbon atoms and hydroxy and halogen derivatives of said metal salts of saturated and unsaturated fatty acids.

4,105,609

DEACTIVATION OF CATALYSTS OF THE ZIEGLER TYPE USED FOR THE PREPARATION OF POLYETHYLENE IN HIGH PRESSURE, HIGH TEMPERATURE PROCESSES

Jean-Pierre Machon, Bethune; Bernard Levresse, Lillebonne, and Pierre Gloriod, Lillebonne, all of France, assignors to Societe Chimique des Charbonnages, Paris, France

Filed Feb. 25, 1976, Ser. No. 661,414
Claims priority, application France, Feb. 28, 1975, 75 06436
Int. Cl.[2] C08F 6/02
U.S. Cl. 260—23 H 10 Claims

1. In a continuous process for the polymerization and copolymerization of ethylene which comprises contacting a reaction mixture comprising ethylene with a Ziegler catalyst comprising a transition metal derivative and an organic derivative of aluminum in a reactor maintained at a pressure of greater than about 500 bars and a temperature of greater than about 160° C., and withdrawing said reaction mixture from said reactor through a reactor outlet valve into a separator for separating said ethylene from polymer formed in said reactor, the improvement which comprises terminating said polymerization by injecting into said reaction mixture a salt which upon a reaction with said Ziegler catalyst will form reaction products which remain with said polymer, said salt being selected from the group consisting of alkali metal salts and alkaline earth metal salts of carboxylic acid and mixtures thereof, said salt being present in an amount sufficient to deactivate said Ziegler catalyst.

4,105,610

REACTION PRODUCTS OF POLYDIOLEFINS, PHENOLS AND UNSATURATED CARBOXYLIC ACIDS

Albert Jung, Taunusstein; Kurt Hultzsch, Wiesbaden-Biebrich; Rolf Zimmermann, Wiesbaden-Sonnenberg, and Johannes Reese, Wiesbaden-Biebrich, all of Germany, assignors to Hoechst Aktiengellschaft, Frankfurt, Germany

Continuation of Ser. No. 422,565, Dec. 6, 1973, abandoned. This application Jan. 22, 1976, Ser. No. 651,530

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1973, 2358722; Nov. 20, 1973, 2357762; Dec. 9, 1972, 2260376

Int. Cl.[2] C08L 93/00; C08F 8/46

U.S. Cl. 260—27 BB 29 Claims

1. An ungelled conjoint reaction product derived from a single step reaction of I. a diolefin polymer having a molecular weight up to 100,000 or its components with II. a phenol and III. an olefinically unsaturated carboxylic acid or its anhydride wherein I. is a reaction component selected from the group consisting of

(a) a homopolymer of a diene having 4 to 10 carbon atoms,

(b) a copolymer of at least two dienes of (a),

(c) a copolymer of at least one diene of (a) with a minor molar amount of at least one copolymerisable olefinically unsaturated monomer and

(d) a combination of at least two of (a) to (c); wherein the amount of phenol is in the range from 2 to 40% by weight and the amount of the unsaturated carboxylic acid or its anhydride is in the range from 2 to 55% by weight, always referred to the starting polymer I.

4,105,611

ADHESIVE COMPOSITION AND BINDING METHOD

George Otto Orth, Jr., Seattle, Wash., assignor to Norfin, Inc., Seattle, Wash.

Filed Aug. 5, 1976, Ser. No. 711,740

Int. Cl.[2] C08L 93/00

U.S. Cl. 260—27 EV 9 Claims

1. A hot melt adhesive composition, having a viscosity of less than 5,000 centipoise at 250° F, comprising by weight: 30% to 40% of an ethylene-vinyl acetate copolymer; 25% to 35% of a wax; 20% to 40% of a modified rosin; and 10% to 30% of a tackifier which is fluid at room temperature.

4,105,612

ASPHALT COMPOSITION AND ITS MANUFACTURE

Donald Royal Cushman, Wenonah; Charles Anthony Pagen, West Deptford; John William Schick, Cherry Hill, all of N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,093

Int. Cl.[2] C08L 91/00

U.S. Cl. 260—27 EV 7 Claims

1. An asphaltic composition comprising a major proportion of straight-run asphalt, a minor proportion of Syntower bottoms topped to 650° F., a minor proportion of a copolymer of ethylene and vinyl acetate, and, optionally, a minor proportion of a terpenic resin.

4,105,613

EPOXY HYDROXOL PRIMER

Richard W. Clope, Waukegan, and Milton A. Glaser, Glenco, both of Ill., assignors to The Dexter Corporation, Windsor Lock, Conn.

Filed Aug. 16, 1976, Ser. No. 714,393

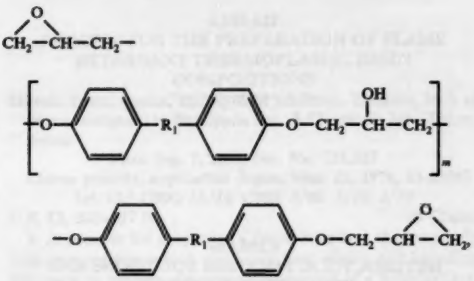
Int. Cl.[2] C08L 61/24, 63/02

U.S. Cl. 260—29.4 R 29 Claims

1. An aqueous-based, heat-curable primer coating composition suitable for metal and the like, having a pH of at least about 9, and being substantially free of organic solvents, which comprises:

(a) from about 30% to about 75% by weight of a binder resin which is a mixture of (i) from about 10% to about 60% by weight of finely divided epoxy resin having an average particle size of less than about 15 microns, and (ii) from about 5% to about 30% by weight of dispersible, methylated methoxymethyl urea resin,

said epoxy resin being of the structural formula



wherein R_1 is an alkylene group of 1–4 carbon atoms and m is a positive integer sufficient to provide a weight average molecular weight of from about 900 to about 8000 and epoxide equivalent weight of from about 450 to about 4000,

said methylated methoxymethyl urea resin being a crosslinking agent and having a formaldehyde:urea molar ratio of 2.2–2.8:1 and a methanol:urea molar ratio of 1.3–2.0:1 and a toluene tolerance of a least 50%; and,

(b) from about 25% to about 70% by weight of water.

4,105,614

STORAGE STABLE WATER-DILUTABLE EPOXY BASED COATING FOR METAL FOOD CONTACT SURFACES

Kenneth G. Davis, Ross Township, Allegheny County; George B. Dué, Pittsburgh, and Albert H. Lund, McCandless, all of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,984

Int. Cl.[2] C08L 63/02

U.S. Cl. 260—29.4 R 11 Claims

1. A water solubilizable resin that comprises an adduct of a bisphenol and a diglycidyl ether of a bisphenol having an epoxy equivalent weight between about 180 and about 2500, using a molar ratio of bisphenol to diglycidyl ether between about 2:1 and about 9:8, further adducted with a polycarboxylic acid anhydride in an amount sufficient to provide an acid number between about 35 and about 150.

4,105,615

INTERPOLYMERS, METHOD OF PREPARING THE SAME AND EMULSIONS THEREOF, AND METAL CANS COATED WITH THE INTERPOLYMERS

Sergio E. Balatan, Westland, Mich., assignor to M&T Chemicals Inc., Stamford, Conn.

Division of Ser. No. 715,063, Aug. 17, 1976, abandoned. This application Jul. 20, 1977, Ser. No. 817,215

Int. Cl.[2] C08L 33/02, 33/08, 33/12, 33/24

U.S. Cl. 260—29.6 T 18 Claims

1. A method of preparing aqueous coating composition of hydrophobic copolymers comprising of the steps of

(a) polymerizing monomers in organic solvent in the presence of about 0.5% to about 6% by weight of a free radical initiator based on the weight of the monomers and in which the total weight of the monomers is about 60% to about 80% by weight of the total charge, said monomers consisting of

15 to 60% of aromatic vinyl monomer

20 to 50% of a long chain acrylate ester monomer

3 to 30% of an alkoxyalkyl(meth)acrylamide

0 to 12% of an unsaturated carboxylic acid monomer

(b) emulsification of the resultant copolymer solution in

water using about 0.25% to about 3% by weight of surfactant based on the weight of the copolymer and adjusting pH of the resulting emulsion with amines to about 6.5 to 10.

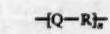
4,105,616

HETEROCYCLIC POLYMER SOLUTIONS AND PRODUCTS THEREFROM

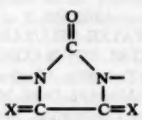
Tad L. Patton, Baytown, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Oct. 26, 1977, Ser. No. 845,566
Int. Cl.² C08K *5/15*
U.S. Cl. 521—62 **26 Claims**

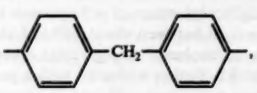
1. A solution of polymer having the repeating unit:



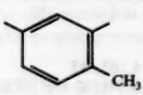
wherein Q is



wherein X is 0 or NH, provided that at least one X is 0, R is selected from the group consisting of

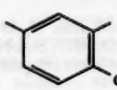


(1)

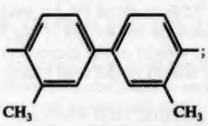


(2)

(3) mixtures of (1) and (2), and (4) 50 to 70 mole percent



and 30 to 50 mole percent



and *n* is sufficiently large to produce a solid product in a solvent selected from the group consisting of epichlorohydrin, epibromohydrin, and glycidyl acrylate.

4,105,617

ORGANIC SOLVENT DISPERSIONS OF SILICONE ELASTOMERS

William H. Clark, and Charles E. Skinner, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 578,707, May 19, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,786
Int. Cl.² C08K *5/09*
U.S. Cl. 260—31.2 N **10 Claims**

1. A silicone elastomeric composition obtained by mixing ingredients consisting essentially of

(A) 100 parts by weight of a benzene soluble hydroxyl endblocked polydimethylsiloxane having a viscosity of at least 100,000 cps. at 25° C.,

(B) from 12 to 35 parts by weight of a soluble ethylpolysilicate,

(C) from 8 to 20 parts by weight of a silane of the formula

$$RSi(O{-}N{=}CR'R^2)_3$$

in which R is selected from the group consisting of methyl and vinyl, and R′ and R^2 are each selected from the group consisting of methyl and ethyl,

(D) from 0.1 to 2 parts by weight of organotin carboxylate,

(E) from 10 to 150 parts by weight of an extending filler, and

(F) sufficient organic solvent to provide a solvent content of from 15 to 95 weight percent solvent based on the total weight of the composition, said organic solvent being selected from the group consisting of aliphatic hydrocarbons, chlorinated aliphatic hydrocarbons, aromatic hydrocarbons, ketones, esters, ethers and mixtures thereof wherein said organic solvent being a solvent for the silicon containing species and alcohols can be present in the organic solvent in amounts which do not exceed 10 weight percent of the total solvent, the combined parts by weight of (B) and (C) being from 20 to 50 parts by weight based on 100 parts by weight of (A) and the weight ratio of (B) to (C) being from 1.0 to 3.0.

4,105,618

CONTROL OF INCOMPETENT FORMATIONS WITH THICKENED COMPOSITIONS CONTAINING BASE-SETTABLE RESIN

Thomas R. Sifferman, and Derry D. Sparlin, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 760,251, Jan. 17, 1977. This application Aug. 25, 1977, Ser. No. 827,488
Int. Cl.² E21B *33/138*
U.S. Cl. 260—33.6 UA **9 Claims**

1. A composition for positioning a base-settable polymeric material having particulate matter disposed therein in contact with a subterranean formation penetrated by a wellbore, the composition consisting essentially of:

(a) a substantially neutral hydrocarbon oil;

(b) a carboxy vinyl polymer selected from the group consisting of: an essentially linear polymer of an alpha, beta-monoolefinically, terminally unsaturated carboxylic acid having 3 to 4 carbon atoms and having an average molecular weight of about 5000 to about 500,000; a cross-linked interpolymer of said monocarboxylic acid and about 0.25 to 2.5 percent by weight of a polyunsaturated compound having at least two alkenyl groups and copolymerizable therewith, the interpolymer having an average molecular weight greater than about 200,000; and the aforesaid polymer and interpolymer containing up to 20 mole percent of copolymerized alkyl ester of the monocarboxylic acid wherein the alkyl group of the ester has 1 to 8 carbom atoms, the ca. ..oxy vinyl polymer being present in the composition in an amount sufficient to produce an apparent viscosity in the composition of at least 50 cps, but less than 5000 cps at the injection temperature and pressure

and an apparent minimum viscosity at bottom hole conditions of at least 25 cps;

(c) a neutralizing agent for the carboxy vinyl polymer;

(d) a miscible polar solvent for the carboxy vinyl polymer;

(e) finely-divided solid particulate material in an amount equal to about 0.25 to about 22 parts of particulate matter per gallon of the oil; and

(f) a base-settable liquid thermosetting resin in an amount equal to about 0.1 to about 5.0 gallons per cubic foot of the particulate material.

4,105,619
CABLE FILLER

John Joseph Kaufman, Parker, Pa., and Thomas Emil Luisi, Plainview, N.Y., assignors to Witco Chemical Corporation, New York, N.Y.

Filed May 20, 1977, Ser. No. 798,977
Int. Cl.[2] C08K *5/01*
U.S. Cl. 260—33.6 PQ 9 Claims

1. A cable filling and flooding composition comprising at least about 90% by weight of petrolatum; about 5–7% by weight of polybutene-1; about 0.5–2.0% by weight of polyethylene; and about 0.5–2.0% by weight of an ethylene propylene rubber.

4,105,620
STABILIZATION OF BARIUM, STRONTIUM AND CALCIUM COMPLEXES OF POLYTEREPHTHALOYL OXALAMIDRAZONE AND POLYDIPHENYLETHER-DICARBOXYLIC ACID-4,4'-OXALAMIDRAZONE

Joachim Behnke, Amorbach, Fed. Rep. of Germany; Dieter Frank, Naperville, Ill., and Michael Wallrabenstein, Wörth, Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Mar. 24, 1977, Ser. No. 780,834
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1976, 2612669
Int. Cl.[2] C08G *73/08;* C08L *79/06*
U.S. Cl. 260—37 N 11 Claims

1. A process for stabilizing a polymer selected from the class consisting of the barium, strontium and calcium complexes of polyterephthaloyl oxalamidrazone and polydiphenylether dicarboxylic acid-4,4'-oxalamidrazone, which process comprises treating said polymer in an aqueous solution having a pH range of 1 to 7 of a stabilizing amount of an acid or salt compound selected from the group consisting of oxalic acid, alkali oxalate, alkali sulfite, alkali hydrogen sulfite, alkali dithionite and alkali hydrogen sulfate.

4,105,621
THERMOPLASTIC POLYAMIDE COMPOSITION

John Maslen, Hoddesdon, and William Hunter Taylor, Welwyn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 28, 1977, Ser. No. 763,700
Claims priority, application United Kingdom, Feb. 20, 1976, 6796/76
Int. Cl.[2] C08L *77/00*
U.S. Cl. 260—37 N 14 Claims

1. A reinforced polyamide composition comprising:

from 30 to 74.95% of a normally flammable polyamide,

from 15 to 59% of a reinforcing agent,

from 5 to 30% of a halogenated flame retardant,

containing at least 20% by weight of the flame retardant of halogen,

together with a synergist system for the flame retardant comprising a mixture of

from 5 to 30% by weight of a zinc borate that is thermally stable at the processing temperatures of the polyamide, and

from 0.05 to 1.5% of an oxide selected from the group consisting of antimony oxide, zinc oxide, lead oxide, ferrous oxide, ferric oxide, stannous oxide, stannic oxide, cadmium oxide and a mixture thereof,

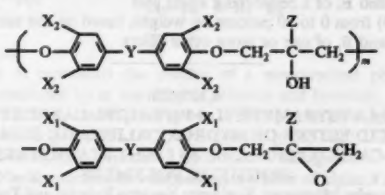
wherein all percentages of all ingredients are by weight of the total weight of composition.

4,105,622
PROCESS FOR THE PREPARATION OF FLAME RETARDANT THERMOPLASTIC RESIN COMPOSITIONS

Hitoshi Izutu, Osaka, and Ryoichi Ishikawa, Takaishi, both of Japan, assignors to Dainippon Inc. & Chemicals Inc., Tokyo, Japan

Filed Sep. 7, 1976, Ser. No. 721,327
Claims priority, application Japan, Mar. 22, 1976, 51-29867
Int. Cl.[2] C08G *18/34;* C08K *3/40, 3/10, 3/34*
U.S. Cl. 260—37 N 20 Claims

1. A process for preparing a flame retardant thermoplastic resin composition which comprises heat mixing and kneading 100 parts by weight of a mixture consisting of a hydroxyl-terminated low molecular weight thermoplastic polyester (A) selected from the group consisting of polyethylene terephthalate, polypropylene terephthalate and polybutylene terephthalate having a hydroxyl value of from 7 to 40 and an intrinsic viscosity, as measured in a 6:4 solvent mixture of phenol and tetrachloroethane at 30° C, of 0.15–0.6 dl/g and a polyfunctional isocyanate (B), or a reaction product of (A) and (B), with 1.5–25 parts by weight, calculated as halogen, of a halogenated epoxy compound of the formula



wherein X_1 is either hydrogen, chlorine or bromine, with the proviso that when *l* and *m* are zero, it is either chlorine or bromine, X_2 is either chlorine or bromine, Y is selected from the group consisting of an alkylidene group of 1–6 carbon atoms, cycloalkylidene, —S—, —SO—, —SO_2— and —O—, Z is selected from the group consisting of hydrogen or methyl, and *n* is a number from 0–15, 0.3–15 parts by weight, calculated as antimony, of an antimony compound, 0.10 parts by weight of asbestos, and 0–60% by weight, based on the total weight of the resin composition obtained of glass fibers.

4,105,623
METHOD OF MAKING MOLDING COMPOUNDS AND MATERIALS MADE THEREBY

Richard F. Shannon, Lancaster, and Douglas L. Denton, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 17, 1976, Ser. No. 751,568
Int. Cl.[2] C08K *7/14*
U.S. Cl. 260—38 25 Claims

1. A new and improved method of producing molding compounds comprising: mixing an inorganic filler with monomers for producing an aldehyde condensate utilizing a mole ratio of the monomers that provides a deficiency of the aldehyde, reacting the monomers insitu under acid conditions to produce an exotherm and generally B-stage the reactants, mixing sufficient gas producing crosslinking agent into the mixture for C-staging the reactants at a later time, spreading the mixture in a thin sheet, embedding inorganic fibers into the sheet, partially reacting the materials to liberate gases but without carrying the reaction to the C-stage, stopping the reaction, and

aging the sheet to cause a thickening reaction which provides a solid handleable sheet molding compound.

4,105,624

REINFORCED VINYL CHLORIDE POLYMER COMPOSITIONS CONTAINING POLY-NEOPENTYLENE TEREPHTHALATE

Klaus Boehlke, Hessheim; Martin Welz, Bad Duerkheim; Peter Föerster, Ludwigshafen; Hans-Josef Sterzel, Dannstadt-Schauernheim; Rolf Wurmb, Heidelberg, and Hans Geörg Matthies, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,820

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621724

Int. Cl.[2] C08K *7/14, 7/20*

U.S. Cl. 260—40 R 6 Claims

1. A reinforced vinyl chloride polymer composition containing

(A) from 99 to 50 parts by weight of a homopolymer of vinyl chloride or a copolymer of vinyl chloride with up to 30 percent by weight of one or more copolymerizable monomers,

(B) from 1 to 50 parts by weight of a linear terephthalic acid-neopentylglycol polyester which is solid at room temperature and is compatible with the vinyl chloride polymer, with the proviso that the sum of A and B is 100,

(C) from 10 to 50 percent by weight, based on the sum of A and B, of a reinforcing agent and

(D) from 0 to 90 percent by weight, based on the sum of A and B, of one or more other fillers.

4,105,625

2,2,6,6-TETRAMETHYL-4-PIPERIDYL CARBOXYLIC ACID ESTERS OF HYDROXY ALIPHATIC DI- AND TRI-CARBOXYLIC ACIDS AS LIGHT STABILIZERS FOR SYNTHETIC POLYMERS

Motonobu Minagawa, Kosigaya; Naohiro Kubota, and Toshihiro Shibata, both of Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

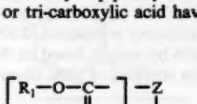
Filed Feb. 22, 1977, Ser. No. 770,475

Claims priority, application Japan, Mar. 19, 1976, 51/30349

Int. Cl.[2] C08K *5/34;* C07D *211/06*

U.S. Cl. 260—45.8 N 24 Claims

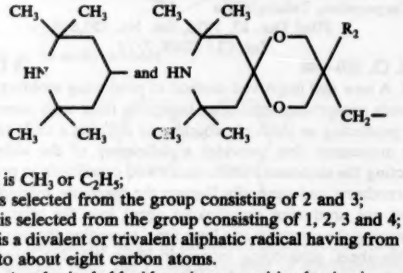
1. A 2,2,6,6-tetramethyl-4-piperidyl carboxylic acid ester of an aliphatic di- or tri-carboxylic acid having the general formula:



I

wherein:

R_1 is selected from the group consisting of



R_2 is CH_3 or C_2H_5;

a is selected from the group consisting of 2 and 3;

m is selected from the group consisting of 1, 2, 3 and 4; and

Z is a divalent or trivalent aliphatic radical having from two to about eight carbon atoms.

16. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F, comprising a polyvinyl chloride resin formed at least in part of the recurring group:

and having a chloride content in excess of 40%, where X is either hydrogen or chlorine; and a compound in accordance with claim 1.

4,105,626

DERIVATIVES OF 4-OXOPIPERIDINES AND THEIR USE AS POLYMER STABILIZERS

Heimo Brunetti, Reinach; Jean Rody, Basel, both of Switzerland; Nobuo Soma, and Tomoyuki Kurumada, both of Tokyo, Japan, assignors to Ciba-Geigy Corporation, Ardsley, N.Y. and Sankyo Company, Limited, Tokyo, Japan

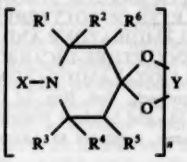
Filed May 19, 1976, Ser. No. 687,774

Claims priority, application United Kingdom, May 28, 1975, 23228/75

Int. Cl.[2] C08K *5/34, 5/35;* C07D *491/10*

U.S. Cl. 260—45.8 NZ 24 Claims

1. Compounds of the formula I



I

or mixtures of isomers thereof or acid addition salts thereof, wherein

n is 1 or 2,

R^1 is ethyl,

R^2 is alkyl having 1–6 C-atoms,

R^3 is ethyl, phenyl, benzyl or phenethyl,

R^4 is alkyl having 1–6 C-atoms, or

R^3 and R^4 together with the C-atom to which they are attached represent a cyclopentyl or cyclohexyl group,

R^5 is alkyl having 1–5 C-atoms, alkenyl or alkinyl having 3–4 C-atoms or aralkyl having 7–8 C-atoms,

R^6 is hydrogen, alkyl having 1–5 C-atoms, alkenyl or alkinyl having 3–4 C-atoms, aralkyl having 7–8 C-atoms

and R^5 and R^6 are interchangeable,

X is hydrogen, the oxyl radical, alkyl having 1–8 C-aroms, alkenyl having 3–6 C-atoms, alkinyl having 3–6 C-atoms, alkoxyalkyl having 2–21 C-atoms, aralkyl having 7–8 C-atoms, the 2,3-epoxypropyl group, an aliphatic acyl group having 1–12 C-atoms, or one of the groups —CH_2COOR^7, —CH_2—CH(R^8)—OR^9 or —COOR^{10} wherein

R^7 is alkyl having 1–12 C-atoms, alkenyl having 3–6 C-atoms, phenyl, aralkyl having 7–8 C-atoms or cyclohexyl,

R^8 is H, CH_3 or phenyl,

R^9 is H or an aliphatic, aromatic, araliphatic, or alicyclic acyl group having up to 18 C-atoms, which may optionally be substituted in its aryl moiety with chlorine, alkyl having 1–4 C-atoms, alkoxy having 1–8 C-atoms and/or hydroxy,

R^{10} is alkyl having 1–12 C-atoms, benzyl, phenyl or cyclohexyl and if *n* is 1,

Y is one of the groups

—C(R^{11}) (R^{12})—CH(R^{13})—, o-phenylene,

—CH(R^{11})—CH_2—C(R^{12}) (R^{13})—, —CH(R^{12})—CH_2—C(R^{11}) (R^{13})—,

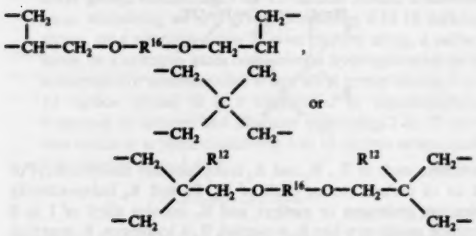
—CH_2—C(R^{11}) (R^{12})—CH(R^{13})—,

wherein R^{11} is hydrogen, methyl or —CH_2OR^{14},

R^{12} is hydrogen, methyl or ethyl,
R_{13} is hydrogen, methyl or ethyl,
R^{14} is hydrogen or a monovalent acyl residue derived from an aliphatic, cycloaliphatic, aromatic or araliphatic monocarboxylic acid having up to 18 C-atoms, which may be substituted in its aryl moiety with halogen, hydroxy and-/or lower alkyl groups, or R^{14} is alkyl having 1–4 C-atoms, alkenyl having 3 or 4 C-atoms, benzyl or a carbamoyl residue —CO—NH—R^{15} wherein R^{15} is alkyl having 1–12 C-atoms, cyclohexyl, aralkyl having 7 or 8 C-atoms or aryl having 6–12 C-atoms,

and if n is 2

Y is one of the groups



wherein R^{16} is a divalent acyl residue derived from an aliphatic, aromatic or araliphatic dicarboxylic acid having up to 12 C-atoms or R^{16} is a dicarbamoyl residue —CONH—R^{17}—NH-CO—, wherein R^{17} is alkylene having 2–8 C-atoms, arylene having 6–12 C-atoms, xylylene or methanediphenylene.

13. A method of stabilizing organic polymers against light-induced deterioration, consisting in the addition of 0.01 to 5% by weight of a compound of formula I as defined in claim 1 to the polymer.

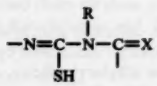
4,105,627

MERCAPTOHETEROCYCLIC RESIN STABILIZERS

Tetsuo Sekiguchi, Hasuda; Masami Abe, Tokorozawa; Kouji Tsuruga, Ohmiya, and Nobuhide Tominaga, Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Sep. 20, 1976, Ser. No. 725,356
Int. Cl.² C08K *5/34, 5/37, 5/52*; C09K *3/00*
U.S. Cl. 260—45.8 N **20 Claims**

1. A stabilizer composition capable of improving the initial clarity and resistance to deterioration when heated at 350° F of halogen-containing resins of the class consisting of polyvinyl fluoride and vinyl chloride polymers, consisting essentially of (A) at least one heterocyclic nitrogen compound having as part of a heterocyclic ring of 5 to 6 members having 2 to 3 nitrogen atoms when five-membered and 3 nitrogen atoms when six-membered the group



in which R is selected from the group consisting of hydrogen, aryl, and alkyl having from 1 to about 12 carbon atoms, and X is selected from the group consisting of oxygen and sulfur; and (B) for each part by weight of (A) from 1 to 500 parts by weight of at least one compound selected from the group consisting of 1,2-epoxides having 18 to about 150 carbon atoms, organic phosphites having at least one organic radical attached to phosphorus through oxygen, and stannous tin, zinc, and aluminum salts of non-nitrogenous monocarboxylic acids having from 6 to 24 carbon atoms.

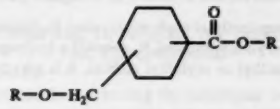
4,105,628

HALOGEN-CONTAINING AROMATIC ETHER-ESTER FIRE-RETARDANTS FOR PLASTICS

Egon Norbert Petersen, Neunkirchen-Seelscheid, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Sep. 30, 1976, Ser. No. 728,097
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1975, 2544513
Int. Cl.² C07C *69/76*; C08K *5/41, 5/10, 5/36*
U.S. Cl. 260—45.85 R **12 Claims**

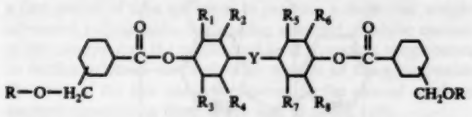
1. Aryloxymethylbenzoic acid phenyl ester of the formula



wherein each R represents the residue of a mononuclear phenol substituted by at least one of chlorine and bromine.

5. Plastic composition containing the ester of claim 1 in an amount effective to render the composition fire resistant.

9. Aryloxymethylbenzoic acid phenyl ester of the formula



wherein:
each R represents the residue of a mononuclear phenol substituted by at least one of chlorine and bromine,
Y is nothing, a methylene group, a dialkylmethylene group, a chalcogen atom, -SO-, or a sulfone group, and
each of R_1 to R_8 represents hydrogen or halogen.

11. Plastic composition containing the ester of claim 9 in an amount effective to render the composition fire resistant.

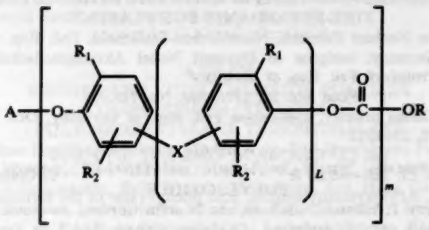
4,105,629

SYNTHETIC RESIN STABILIZER COMPRISING A THIOETHER ESTER AND HINDERED PHENOLIC CARBONATE

Motonobu Minagawa, Koshigaya; Yutaka Nakahara, Iwatsuki, and Tohru Haruna, Okegawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

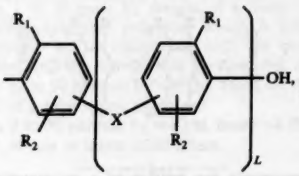
Filed Oct. 13, 1976, Ser. No. 732,038
Claims priority, application Japan, Oct. 14, 1975, 50-123711
Int. Cl.² C08K *5/13, 5/36*
U.S. Cl. 260—45.8 NT **18 Claims**

1. A stabilizer composition useful in synergistically increasing the resistance of a synthetic resin to deterioration when heated comprising in combination (a) at least one thioether ester of a polyhydric alcohol having 5 to 15 carbon atoms and 3 to 8 primary hydroxyl groups with a 3-alkylthiopropionic acid having 4 to about 34 carbon atoms, and (b) at least one 400 to 4000 molecular weight carbonate ester terminating in a phenolic hydroxyl, alkyl carbonate, or phenyl carbonate group, and having the formula:



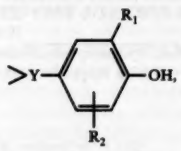
wherein independently at each occurrence R_1 denotes an alkyl, cycloalkyl or arylalkyl radical, R_2 denotes a hydrogen atom, or an alkyl, cycloalkyl or arylalkyl radical, A is a hydrogen atom or

R is an alkyl or phenyl radical or

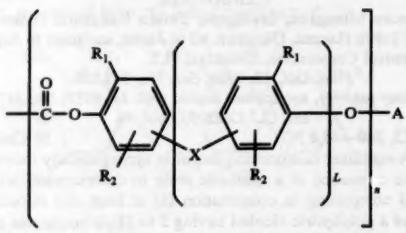


X is a direct bonding, –O–, –S–,

$-CH_2SCH_2-$, a divalent hydrocarbon radical or



where Y is a trivalent hydrocarbon radical, B is selected from the group consisting of hydrogen and



L is 0 or 1, *m* is 1 to about 20, and *n* is 0.1 to about 20.

15. A stabilized synthetic resin composition comprising a synthetic resin and a stabilizing amount of stabilizer composition according to claim 1.

4,105,630

EPOXY RESINS FLAMEPROOFED WITH 1,2-OXAPHOSPHOLANES

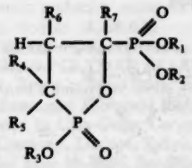
Roland A. E. Winter, Armonk, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 614,403, Sep. 18, 1975, Pat. No. 4,042,649. This application Jun. 2, 1977, Ser. No. 802,923

Int. Cl.[2] C08K 5/53

U.S. Cl. 260—45.8 R **12 Claims**

9. A cured flameproof epoxy resin which contains from 2 to 30% by weight based on the resin of at least one compound of the Formula I



(I)

wherein each of R_1, R_2 and R_3 independently denotes alkyl of 1 to 18 carbon atoms; each of R_4, R_5 and R_6 independently denotes hydrogen or methyl; and R_7 denotes alkyl of 1 to 8 carbon atoms or when R_4 is methyl, R_6 is hydrogen, R_5 together with R_7 can denote 2,2-dimethyl-1,3-trimethylene.

4,105,631

MULTICHROMOPHORIC ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

Richard H. S. Wang, and Gether Irick, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 626,521, Oct. 28, 1975, Pat. No. 4,043,973, which is a division of Ser. No. 511,570, Oct. 2, 1974, Pat. No. 3,936,419. This application Jun. 2, 1977, Ser. No. 802,924

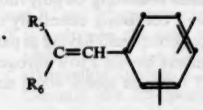
Int. Cl.[2] C08K 5/45, 5/34, 5/15

U.S. Cl. 260—45.8 A **7 Claims**

1. An organic composition susceptible to ultraviolet degradation stabilized against such degradation with a stabilizing amount of a composition of matter comprising compounds having the formula:

$(A\text{-}B)_2\,C$

wherein A is a group having the structure



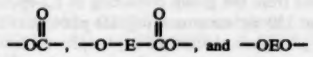
I

wherein

I is hydrogen, fluoro, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, alkoxy, aryloxy, substituted amino, cyano, or carboalkoxy;

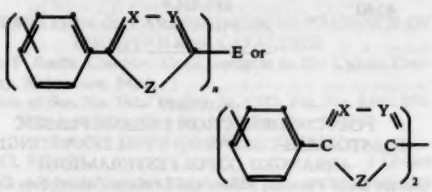
R_5 and R_6 are cyano, carbonylalkoxy, carbonylaryloxy, alkylsulfonyl, alkylcarbonyl, arylsulfonyl, arylcarbonyl, carboxamide or sulfonamide;

B is a linking group connecting A and C and can have the structure



where E is lower alkylene or substituted lower alkylene;

C group is a heterocyclic group having the structure



wherein

X and Y are a carbon atom, a carbon atom containing an alkyl group containing 1 to 12 carbon atoms, a carbon atom containing an aryl group containing 6 to 18 carbon atoms, or a nitrogen atom; Z is an oxygen atom, a sulfur atom, or a nitrogen atom containing a hydrogen atom or a substituted or unsubstituted lower alkyl group having 1 to 12 carbon atoms; E is a substituted or unsubstituted, branched or unbranched alkylene containing 1 to 12 carbon atoms or arylene containing 6 to 18 carbon atoms; and n is an integer from 1 to 6.

4,105,632

FLAME RETARDED ABS POLYMERIC COMPOSITIONS CONTAINING A MIXED HALO BISPHENOXY ALKANE FLAME RETARDANT AND ENHANCING AGENT

Arnold L. Anderson, Antioch, Ill., and Robert J. Nulph, Ypsilanti, Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

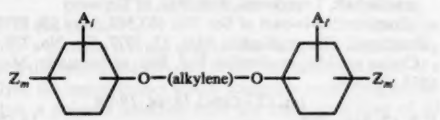
Continuation-in-part of Ser. No. 330,837, Feb. 8, 1973, Pat. No. 4,051,105, which is a continuation-in-part of Ser. No. 260,240, Jun. 6, 1972, abandoned. This application Jun. 8, 1977, Ser. No. 804,667

The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.

Int. Cl.² C08L 9/02

U.S. Cl. 260—45.75 D **18 Claims**

1. A plastic composition containing acrylonitrile-butadiene-styrene having incorporated therein (1) an effective amount of a flame retardant which is a bis-phenoxy compound having the formula:



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine; and (2) an enhancing agent which is antimony, arsenic, bismuth, tin or zinc-containing compound.

4,105,633

ALTERNATING COPOLYESTERCARBONATE RESINS

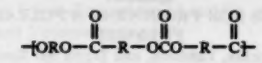
Daniel J. Swart, and Jacqueline S. Kelyman, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 11, 1977, Ser. No. 795,978

Int. Cl.² C08G 63/62

U.S. Cl. 528—176 **10 Claims**

1. A normally solid alternating copolyestercarbonate consisting essentially of repeating units of the formula:



wherein each R is independently aromatic hydrocarbylene or inertly substituted aromatic hydrocarbylene.

4,105,634

PRODUCTION OF THERMOSETTING RESINOUS POLYEPOXIDES

Harry T. Hanson, Millburn, and Marvin Gordon, Succasunna, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 11, 1976, Ser. No. 713,622

Int. Cl.² C08G 59/02

U.S. Cl. 526—65 **12 Claims**

1. In a process for advancing the molecular weight of thermosetting resinous polyepoxides wherein a dihydric phenol and a resinous polyepoxide containing 1,2-epoxy groups are reacted in the presence of a catalyst to produce a molecular weight advanced thermosetting resinous polyepoxide, the improvement comprising, after a first catalytic amount of the catalyst is introduced into the mixture of the dihydric phenol and the polyepoxide and the reaction has been maintained for a first period of time sufficient to produce a molecular weight advanced polyepoxide, introducing a second catalytic amount of the catalyst into the mixture while at a reaction temperature to further advance the molecular weight of the polyepoxide the ratio of the first catalytic amount to the second catalytic amount constituting from about 10:1 to about 1:10.

4,105,635

MANUFACTURE OF AROMATIC POLYMERS CONTAINING KETONE AND SULPHONE GROUPS

John Leslie Freeman, St. Neots, England, assignor to Imperial Chemical Industries Limited, Great Britain

Filed Jun. 28, 1977, Ser. No. 810,728

Claims priority, application United Kingdom, Jul. 12, 1976, 28841/76

Int. Cl.² C08G 65/40

U.S. Cl. 528—126 **10 Claims**

1. A process for the production of an aromatic polyethersulphone and/or ketone comprising distilling off the water from a substantially equimolar mixture of a finely divided hydrated dialkali metal salt of a bisphenol and an aromatic dihalide in which the halogen atoms are activated by $-SO_2-$ or $-CO-$ groups ortho or para thereto in the presence of an aromatic sulphone solvent and thereafter heating at a temperature in the range 250° to 400° C to effect polymerisation.

4,105,636

PRODUCTION OF AROMATIC POLYETHERS

Ian Charles Taylor, Bengeo, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 11, 1977, Ser. No. 814,667

Claims priority, application United Kingdom, Jul. 28, 1976, 31453/76

Int. Cl.² C08G 65/40, 75/23

U.S. Cl. 528—126 **9 Claims**

1. A process for the production of an aromatic polyether comprising boiling an inert organic sulphoxide or sulphone solvent containing (i) a substantially equimolar mixture of (a) at least one bisphenol and (b) at least one dihalobenzenoid compound, or (ii) at least one halophenol, in which dihalobenzenoid compound or halophenol the halogen atoms are activated by $-SO_2-$ or $-CO-$ groups ortho or para thereto, and an alkali metal carbonate, the amount of said carbonate being such that there is at least one alkali metal atom for each phenol group present, and removing water by distillation in the absence of an azeotrope forming solvent.

4,105,637

PROCESS FOR PRODUCING A POLYACETAL POLYMER

Michael Semanchik, Lebanon, and David M. Braunstein, Fanwood, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 11, 1974, Ser. No. 514,146
Int. Cl.[2] C08G 2/10
U.S. Cl. 528—241 18 Claims

1. In a process for producing a polyacetal polymer in which a polyacetal forming polymerization mixture is introduced into a polymerization reaction zone, the mixture polymerized to form polyacetal polymer and withdrawing said polyacetal polymer from said polymerization reaction zone, the improvement which comprises pulverizing and grinding said polyacetal polymer by means of a plurality of inter-meshing elliptical shape plates provided on each shaft of a pair of shafts, said plates having flattened edges at the major axis which mesh to wipe the surface of its mating plate to form a finely divided solid polyacetal polymer which is then withdrawn from said reaction zone.

4,105,638

PROCESS FOR IMPROVING THE STABILITY OF ETHERIFIED ACETAL HOMOPOLYMERS

Pierino Radici, Turate (Como); Sergio Custro; Mario Ermoni, both of Gorla Minore (Varese), and Paolo Colombo, Saronno (Varese), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 16, 1976, Ser. No. 751,299
Claims priority, application Italy, Dec. 23, 1975, 30687 A/75
Int. Cl.[2] C08G 2/36
U.S. Cl. 528—130 15 Claims

1. A method for eliminating the unstable polyoxymethylene chains of an etherified acetal homopolymer, which comprises forming a suspension of said etherified acetal homopolymer, a basic compound and a polar liquid diluent, said polar liquid diluent consisting of water or a mixture of at least 20% water and a polar organic compound, said suspension containing 10 to 40 weight % of said homopolymer and 0.05 to 20 weight % based on the weight of the liquid diluent of said basic compound and said suspension having a pH of from 9 to 11;

and heat-treating said suspension at a temperature of from 100° to 160° C and below the melting point of said polymer and at a pressure such as to maintain said diluent in liquid form, for a period of time such as to ensure substantially complete degradation of said unstable chains.

4,105,639

WATER SOLUBLE POLYESTER RESIN

Deno Laganis, Schenectady, and Paul M. Begley, Scotia, both of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Filed May 11, 1977, Ser. No. 795,907
Int. Cl.[2] C08G 63/68
U.S. Cl. 528—177 18 Claims

1. A thermosetting polyester which is soluble in water in the presence of an amine or in a mixture of water with up to 30% of a water miscible polar solvent in the presence of an amine, said polyester having a molecular weight of 800 to 1300, an OH/COOH ratio of 1.8:1 to 3:1 and being prepared from reactants consisting essentially of

(1) (a) an aromatic dicarboxylic acid with 0 to 50% based on the total dicarboxylic acid of a cycloaliphatic dicarboxylic acid,

(b) tris(2-hydroxyethyl)isocyanurate or an aliphatic polyhydric alcohol containing at least three hydroxyl groups,

(c) a primary dihydric alcohol,

(d) a monohydric alcohol, or

(2) (a), (b) and (c), the molar ratio of (c) to (b) being from 75:25 to 40:60 when (d) is not present and the molar ratio of (c) plus (d) to (b) when (d) is present being 75:25 to 40:60.

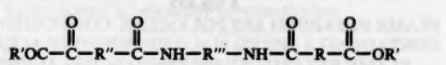
4,105,640

POLYCONDENSATION THERMOPLASTIC ELASTOMERS COMPOSED BY ALTERNATINGLY ARRANGED COPOLYESTERAMIDES

Giorgio Della Fortuna, Milan, and Luciano Zotteri, San Donato Milanese (Milan), both of Italy, assignors to ANIC, S.p.A., Mendrisio Stazione, Switzerland

Filed Jun. 22, 1977, Ser. No. 809,129
Claims priority, application Italy, Jul. 21, 1976, 25548 A/76; May 18, 1977, 23701 A/77
Int. Cl.[2] C08G 63/68
U.S. Cl. 528—292 6 Claims

1. An elastomer of thermoplastic orderly arranged copolyesteramide composed by segments of macromolecule containing diol having a molecular weight lower than 250 and segments containing polyhydroxyalkyleneglycols of average molecular weight comprised between 400 and 3,500, such segments being united to each other by ester bonds, with the intermediary of a radical deriving from a diesterdiamide containing preformed amide bonds having the general formula:



in which R' is an alkyl radical having from 1 to 8 carbon atoms and/or an aryl radical having from 6 to 10 carbon atoms and/or a cycloalkyl radical having from 4 to 10 carbon atoms, and R'' and R''' are bivalent hydrocarbon radicals having from 2 to 30 carbon atoms.

4,105,641

PROCESS FOR THE PREPARATION OF ALIPHATIC POLYCARBONATES AND POLYURETHANES THEREFROM

Hans-Josef Buysch; Heinrich Krimm, and Hans Rudolph, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 687,565, May 18, 1976, abandoned. This application Mar. 17, 1977, Ser. No. 778,659
Claims priority, application Fed. Rep. of Germany, May 27, 1975, 2523352
Int. Cl.[2] C08G 18/44, 18/08
U.S. Cl. 526—712 14 Claims

1. A transesterification process for the preparation of polycarbonates containing aliphatically bound hydroxyl end groups comprising:

(a) reacting

(i) aliphatic dihydroxyl compounds with

(ii) glycol carbonate, in the presence of

(iii) inert solvents selected from the group of compounds consisting of toluene, xylene, ethylbenzene, cumene, 1,2,4-trimethylbenzene, mesitylene, tetramethylbenzene, cymene, diethylbenzene, diisopropylbenzene, chlorotoluene, bromobenzene, tetralin, propenylbenzene, allylbenzene, α-methylstyrene, dibutylether, diisobutylether, diamylether, anisole, phenetole, cresol methyl ether, dibutyl ketone, di-tert.-butyl ketone and diamyl ketone, in which ethylene glycol is substantially immiscible, said inert solvents being capable of forming azeotropes with the ethylene glycol to permit selective azeotropic separation of said ethylene glycol; and

(b) simultaneously separating the ethylene glycol by fractional distillation.

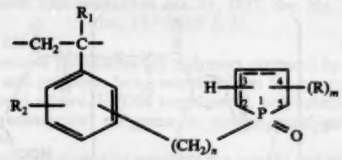
4,105,642

PREPARATION OF CARBODIIMIDE IN PRESENCE OF PHOSPHOLENE CATALYSTS

Curtis P. Smith, Cheshire, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 764,375, Jan. 31, 1977, Pat. No. 4,068,055.
This application Oct. 31, 1977, Ser. No. 846,973
Int. Cl.[2] C08F 8/18, 8/24, 8/40, 12/32
U.S. Cl. 528—51 2 Claims

1. In a process for the preparation of a carbodiimide by heating the appropriate organic isocyanate in the presence of a catalyst, the improvement which comprises employing as said catalyst a polymer characterized by the presence therein of a recurring unit having the formula:



wherein the broken lines in the phospholene nucleus indicate a double bond located between the carbon atom at position 3 and one of the carbon atoms at positions 2 and 4, the H atom is attached to whichever carbon atom at positions 2 and 4 is not part of said double bond, R is a substituent selected from the class consisting of halogen, alkoxy from 1 to 6 carbon atoms, inclusive, phenoxy, hydrocarbyl from 1 to 18 carbon atoms, inclusive, and halohydrocarbyl from 1 to 18 carbon atoms, inclusive, *m* is a whole number from 0 to 3, *n* is 0 or 1 and RS_1 is selected from the class consisting of hydrogen and methyl and R_2 represents hydrocarbyl said hydrocarbyl being free of substituents which are reactive with isocyanate.

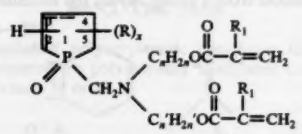
4,105,643

PREPARATION OF CARBODIIMIDE IN PRESENCE OF PHOSPHOLENE CATALYSTS

Curtis P. Smith, Cheshire, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 764,374, Jan. 31, 1977, Pat. No. 4,068,065.
This application Nov. 1, 1977, Ser. No. 847,658
Int. Cl.[2] C08F 18/22, 4/00
U.S. Cl. 528—512 2 Claims

1. In a process for the preparation of a carbodiimide by heating the appropriate organic isocyanate in the presence of a catalyst, the improvement which comprises employing as said catalyst a polymer selected from the class consisting of (i) homopolymer of compounds of the formula



wherein the broken lines in the phospholene nucleus indicate a double bond located between the carbon atom at position 3 and one of the carbon atoms at positions 2 and 4, the H atom is attached to whichever carbon atom at positions 2 and 4 is not part of said double bond, R is selected from the group consisting of halogen, lower-alkoxy, phenoxy, hydrocarbyl from 1 to 18 carbon atoms, inclusive, and halohydrocarbyl from 1 to 18 carbon atoms, inclusive, *x* is 0 to 3, C_nH_{2n} and $C_{n'}H_{2n'}$ are each independently alkylene from 2 to 6 carbon atoms, and R_1 is selected from the class consisting of hydrogen, methyl, halo and cyano and (ii) copolymers of the compounds of the above formula with at least one acrylate selected from the class consisting of the lower-alkyl esters of acrylic, methacrylic, 2-haloacrylic and 2-cyanoacrylic acids.

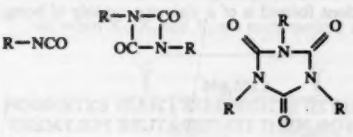
4,105,644

ANIONIC POLYMERIZATION OF CAPROLACTAM AT A TEMPERATURE BELOW THE MELTING POINT OF POLYCAPROLACTAM

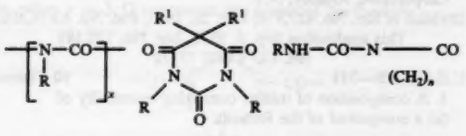
Zbyněk Bukač; Jan Šebenda, both of Prague, and Miloslav Loyda, Neratovice, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Jul. 1, 1976, Ser. No. 701,906
Claims priority, application Czechoslovakia, Jul. 8, 1975, 4847/75
Int. Cl.[2] C08G 69/18
U.S. Cl. 528—314 2 Claims

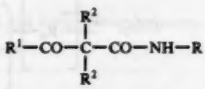
1. A method for manufacturing moldable and extrudable anionic polycaprolactam having a low content of water extractable compounds and a highly stable molecular weight using known basic initiators and known activators of the general formulae I-VII,



I II III



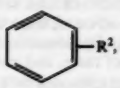
IV V VI



VII

where

R is the aromatic residue



R^1 is R or alkyl with 1 to 4 carbon atoms, cycloalkyl or allyl,

R^2 is alkyl with 1 to 4 carbon atoms, or H atom,

n is an integer from 3 to 11,

x is an integer larger than 3, which comprises, in a first stage, subjecting a polymerization mixture of caprolactam, activator and strong base catalyst, wherein the ratio of said activator to said catalyst is 2.6 to 4.2, to a temperature of 150°–200° C. for at most 10 minutes, shaping the resulting polycaprolactam and thereafter, in a second stage, subjecting said shaped polycaprolactam to a further temperature of 150°–200° C for at most 90 minutes to produce a polycaprolactam having a monomer content very close to the equilibrium amount corresponding to the temperature of this second stage of polymerization.

4,105,645

POLYMERIZATION OF 2-PYRROLIDONE WITH ALKALINE CATALYST AND SO_2 CHAIN INITIATOR

Arthur C. Barnes, and Carl E. Barnes, both of New Canaan, Conn., assignors to Barson Corp., New Canaan, Conn.

Filed Aug. 30, 1976, Ser. No. 718,410
Int. Cl.² C08G 69/24
U.S. Cl. 528—313 15 Claims

1. A process for the polymerization of 2-pyrrolidone comprising the polymerization of substantially anhydrous monomeric 2-pyrrolidone at a temperature of from 30° to 45° C. in the presence of a primary catalyst and an activator consisting essentially of sulfur dioxide, the concentration of sulfur dioxide varying with the temperature used and not exceeding a sulfur dioxide concentration bounded by an approximate straight line drawn on a semi-log graph having a logarithmic scale of sulfur dioxide concentration along the ordinate in terms of mols of sulfur dioxide per mol of 2-pyrrolidone monomer and having polymerization temperature along the abscissa, said line being drawn on said graph from the vicinity of the point at 30° C. temperature and 0.024 mols of sulfur dioxide per mol of monomer to the vicinity of the point at 45° C. temperature and 0.004 mols of sulfur dioxide per mol of monomer, the sulfur dioxide concentration being at least about 0.002 mols of sulfur dioxide per mol of pyrrolidone monomer with the polymerization taking place at a substantially constant temperature, whereby the polypyrrolidone formed is of a viscosity capable of being melt spun.

4,105,646

α,β-UNSATURATED SCHIFF-BASE CHAIN EXTENSION REACTIONS FOR HIGH TEMPERATURE POLYMERS

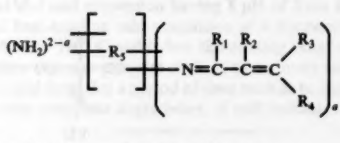
Roland A. E. Winter, Armonk, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 427,976, Dec. 26, 1973, Pat. No. 3,979,350. This application Sep. 3, 1976, Ser. No. 720,181
Int. Cl.² C08G 73/12
U.S. Cl. 528—311 10 Claims

1. A composition of matter consisting essentially of

(a) a compound of the formula

(I)



wherein a is a number from 0.1 to 2,

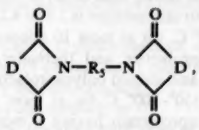
R_1, R_2, R_3 and R_4 are independently hydrogen or a monovalent aliphatic, cycloaliphatic or aromatic radical or a combination of such radicals, and

R_5 is a divalent organic radical containing from 2 to 30 carbon atoms and selected from the group consisting of aromatic, aliphatic, alkylaromatic and cycloaliphatic radicals combinations of these, and radicals with hetero-atom containing bridging groups where the hetero-atom in the bridge is selected from the group consisting of oxygen, sulfur, nitrogen, phosphorus and silicon, and

(b) from about 1 to 10 mole equivalents per mole equivalent of (a) of a bis-dienophile selected from the group consisting of

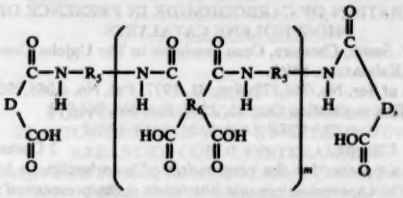
(1) a compound of the formula

XII



(2) a polyamide-acid of the formula

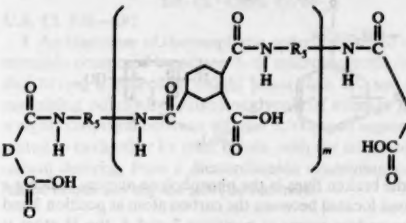
XIII



its corresponding polyimide,

(3) a polyamide-amide acid of the formula

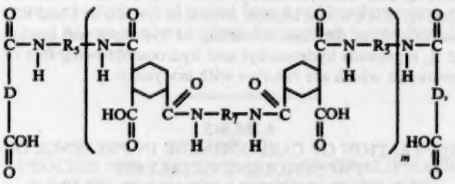
XV



its corresponding polyamide-imide, and

(4) a polyamide-amide acid of the formula

XVI



and its corresponding polyamide-imide,

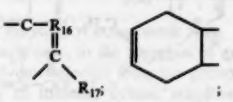
wherein

R_5 and R_7 are the same or different and each is defined as R_5 above,

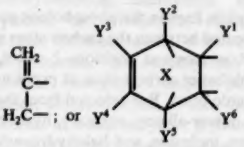
R_6 is a tetravalent aliphatic, cycloaliphatic, aromatic or heterocyclic radical containing at least 2 carbon atoms or a combination of aromatic and aliphatic radicals,

m is a number from 1 to 20, and

D is a divalent radical containing olefinic unsaturation selected from a group having the formula



;



; or

wherein

R_{16} is hydrogen, methyl, bromo or chloro;

R_{17} is hydrogen, bromo or chloro;

Y^1–Y^6 inclusive is selected from the group consisting of

hydrogen, bromine, chlorine, nitro, phenyl, and alkyl of from 1 to 6 carbon atoms; and

X is carbonyl, oxygen, sulfur, chloro or bromo substituted methylene, alkylidene of from 1 to 6 carbon atoms, and benzylidene.

10. A glass fabric or fiber impregnated with the composition according to claim 1.

4,105,647

PROCESS FOR SULFONATING POLYMERS

Charles P. O'Farrell, Clark, and Edward N. Kresge, Watchung, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 445,890, Feb. 26, 1974, abandoned, which is a continuation of Ser. No. 208,384, Dec. 15, 1971, abandoned. This application Jan. 31, 1977, Ser. No. 764,515

Int. Cl.² C08F *8/36*

U.S. Cl. 526—33 **4 Claims**

1. A process for sulfonating polymers prepared by solution process, said polymers being selected from the group consisting of Butyl rubber, EPDM terpolymers, polybutadiene, olefinically unsaturated polymers or styrene butadiene, which comprises:

(a) dissolving monomer reactants in a solvent and polymerizing said reactants in the presence of a Friedel-Crafts or Ziegler type catalyst thereby forming a reactor effluent containing polymer, unreacted light monomer, active catalyst, and solvent;

(b) treating such reactor effluent to remove therefrom substantially all unreacted light monomers; and

(c) simultaneously sulfonating said polymer and quenching said catalyst by treating with an acyl sulfate sulfonating quenching agent, said acyl sulfate having the formula:

$$R\text{—}(COOSO_3H)_n$$

wherein n is an integer from 1 to 3 and wherein R is an organic radical having a carbon number range from about 1 to about 30 and being selected from the group consisting of straight and branched chain alkyls, cycloakyls, alkylated cycloalkyls, and cycloalkylated alkyls, ethers, thioethers, esters, thioesters, ketones and thioketones.

4,105,648

CROSSLINKED POLYACRYLAMIDES CONTAINING SILYL GROUPS

Urs Gruber, Arlesheim; Gerd Greber, Binningen, and Hans-Peter Kriemler, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

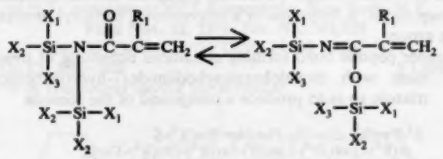
Continuation of Ser. No. 610,203, Sep. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 403,359, Oct. 4, 1973, abandoned. This application Mar. 17, 1977, Ser. No. 778,408

Claims priority, application Switzerland, Oct. 27, 1972, 015731/72

Int. Cl.² C08F *30/08*

U.S. Cl. 526—204 **9 Claims**

1. A crosslinked polyacrylamide containing silyl groups which is prepared by polymerising a silylated acrylic acid amide, of formula *Ia* or *Ib*

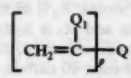


(Ia) (Ib)

wherein

X_1, X_2 and X_3 independently of one another represent hydrogen, alkyl having 1 or 2 carbon atoms, alkoxy having 1 to 4 carbon atoms, cyclohexyl, phenyl, phenoxy or benzyl, and

R_1 is hydrogen or alkyl having 1 to 4 carbon atoms, in the presence of from about 5 to 250 mole%, based on the silylated acrylic acid amide, of a crosslinking agent of formula II



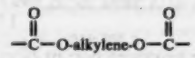
(II)

wherein

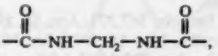
p represents the number 2 or 3,

Q_1 represents hydrogen or methyl,

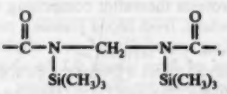
Q, when $p = 2$, represents —SO_2—, phenylene,



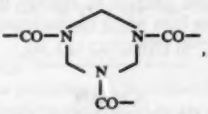
with 2 to 4 carbon atoms in the alkylene moiety,



or, when X_1, X_2 and X_3 are each methyl, also represents



or, when $p = 3$, Q represents the group of the formula



the polymerisation being carried out at a temperature between about 20° and 120° C.

4,105,649

AQUEOUS POLYMERIC THICKENING AGENTS

Syamalarao Evani, and Frederick P. Corson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

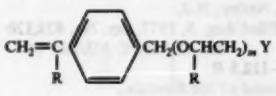
Division of Ser. No. 267,570, Jun. 29, 1972, Pat. No. 4,008,202. This application Oct. 7, 1974, Ser. No. 512,780

Int. Cl.² C08F *222/08, 220/06, 228/04*

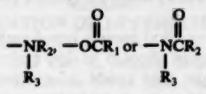
U.S. Cl. 526—271 **8 Claims**

1. A polymer comprising

(a) about 0.2 to 15 mole percent of a vinyl benzyl ether monomer having the formula



wherein R is hydrogen or methyl, m is about 10 to 100 and Y is —SR_1,



where R_1 is an alkyl, aralkyl or alkaryl hydrophobic group of 10 to about 22 carbon atoms, R_2 is an alkyl group of 1 to about 22 carbon atoms and R_3 is hydrogen or an alkyl group of 1 to about 22 carbon atoms, provided R_2 and R_3 in combination have at least 10 carbon atoms.

(b) the balance to make 100 mole percent of one or more copolymerizable ethylenically unsaturated monomers provided a water solubilizing amount of at least one monomer having a carboxylic acid group, an anhydride group, a sulfate group, a sulfonate group or a hydroxyl group is present.

4,105,650

METHOD OF PRESERVING BLOOD PLASMA I

Edward Shanbrom, Santa Ana, and Robert C. Bishop, Los Angeles, both of Calif., assignors to Edward Shanbrom, Inc., Santa Ana, Calif.

Continuation of Ser. No. 567,371, Apr. 11, 1975, abandoned. This application May 16, 1977, Ser. No. 796,924

Int. Cl.[2] **A23J** *1/06*

U.S. Cl. 260—112 B **1 Claim**

1. The method of preserving blood plasma coagulation factors and other proteins thereafter comprising the steps of:

(a) adding to whole, fresh blood plasma a preservative solution consisting essentially of polyethylene glycol to a concentration of from about 0.1 to about 25 grams of polyethylene glycol per liter of plasma;

(b) thereafter freezing the blood plasma containing said preservative; and

(c) thereafter thawing the frozen blood plasma containing the preservative solution to recover therefrom plasma cryoprecipitate from which plasma proteins can be recovered in improved yield.

4,105,651

PURIFICATION OF ENKEPHALIN, AN ENDOGENOUS COMPOSITION IN THE HUMAN BODY AND SYNTHESIS OF SAME

John Hughes, Aberdeen, Scotland, assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Mar. 15, 1976, Ser. No. 666,647

Int. Cl.[2] **C07C** *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **5 Claims**

1. A process for recovering and purifying from mammalian brain tissue an endogenous composition having morphine agonist properties consisting of a mixture of two pentapeptides (a) H-Tyr-Gly-Gly-Phe-Met-OH and (b) H-Tyr-Gly-Gly-Phe-Leu-OH wherein the ratio of *a:b* is from 3:1 to 4:1 and wherein said mammalian brain tissue is extracted with acetone, filtered, transferred to the aqueous phase and separated from lipid impurities by extraction with ether/ethyl acetate at an acid pH of about 3.

4,105,652

SYNTHESIS OF HUMAN β-ENDORPHIN

Johannes Arnold Meienhofer, Upper Montclair, and Su-Sun Wang, Bloomfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 5, 1977, Ser. No. 822,120

Int. Cl.[2] **C07C** *103/52*

U.S. Cl. 260—112.5 R **14 Claims**

1. A compound of the formula

R^1-Try(R^2)-Gly-Gly-Phe-Met-Thr(R^3)-Ser(R^4)-Glu(OR^4)-Lys(R^5)-Ser(R^8)-Gln(R^6)-Thr(R^3)-Pro-Leu-Val-Thr(R^3)-Leu-Phe-Lys(R^5)-Asn(R^6)-Ala-Ile-Ile-Lys(R^5)-Asn(R^6)-Ala-Tyr(R^2)-Lys(R^5)-Lys(R^5)-Gly-Glu(OR^4)-OR^7

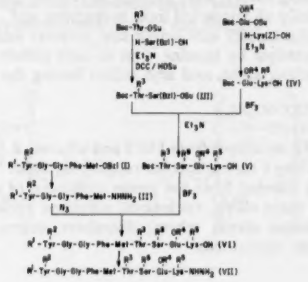
where R^1 is a conventional α-amino protecting group, R^2 is hydrogen or a conventional protecting group for the phenolic hydroxyl group of the tyrosine residue, R^3 is hydrogen or a conventional protecting group for the hydroxyl group of the threonine residue, R^4 is hydrogen or a conventional carboxyl protecting group, R^5 is a conventional ω-amino protecting group, R^6 is hydrogen or a conventional protecting group for the carboxamide group, R^7 is hydrogen or a conventional carboxyl protecting group and R^8 is hydrogen or a conventional protecting group for the hydroxyl group of the serine residue.

14. A process for the preparation of human β-endorphin which process comprises in combination:

(A) reacting a protected nonapeptide of the formula

R^1-Try(R^2)-Gly-Gly-Phe-Met-Thr(R^3)-Ser(R^4)-Glu(OR^4)-Lys(R^5)-OH,

where R^1 is a conventional α-amino protecting group, R^2 is hydrogen or a conventional protecting group for the phenolic hydroxyl group of the tyrosine residue, R^3 is hydrogen or a conventional protecting group for the



hydroxyl group of the threonine residue, R^4 is hydrogen or a conventional carboxyl protecting group, R^5 is a conventional ω-amino protecting group and R^8 is hydrogen or a conventional protecting group for the hydroxyl group of the serine residue with a 22 amino acid partially protected peptide amine of the formula

H_2N-Ser(R^8)-Gln(R^6)-Thr(R^3)-Pro-Leu-Val-Thr(R^3)-Leu-Phe-Lys(R^5)-Asn(R^6)-Ala-Ile-Ile-Lys(R^5)-Asn(R^6)-Ala-Tyr(R^2)-Lys(R^5)-Lys(R^5)-Gly-Glu(OR^4)-OR^7

where R^1, R^2, R^3, R^4, R^5 and R^8 are as above and R^6 is hydrogen or a conventional protecting group for the carboxamide group and R^7 is hydrogen or a conventional carboxyl protecting group

under peptide bond forming conditions consisting of treatment with dicyclohexylcarbodiimide/1-hydroxybenzotriazole so as to produce a compound of the formula

R^1-Tyr(R^2)-Gly-Gly-Phe-Met-Thr(R^3)-Ser(R^8)-Glu(OR^4)-Lys(R^5)-Ser(R^8)-Gln(R^6)-Thr(R^3)-Pro-Leu-Val-Thr(R^3)-Leu-Phe-Lys(R^5)-Asn(R^6)-Ala-Ile-Ile-Lys(R^5)-Asn(R^6)-Ala-Tyr(R^2)-Lys(R^5)-Lys(R^5)-Gly-Glu(OR^4)-OR^7

where R^1, R^2, R^3, R^4, R^5, R^6, R^7 and R^8 are as above; and

(B) removing the protective groups with strong acid so as to yield the desired human β-endorphin.

4,105,653
HETERYL-AZO-PHENYL DISPERSE DYESTUFFS CONTAINING A Z-SUBSTITUTED BENZOLYLOXYALKYL RADICAL, WHEREIN Z IS 2-CYANOVINYL 2-CYANOETHYL OR 2-CHLORO-2-CYANOETHYL

Claude Marie Henri Emile Brouard, Sotteville les Rouen; Bernard Dupont, Roussillon; Jean-Marie Louis Leroy, Saint Etienne du Rouvray, and Jean-Pierre Henri Stiot, Saint Pierre les Elbeuf, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

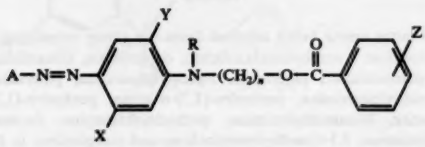
Division of Ser. No. 495,718, Aug. 6, 1974, Pat. No. 3,987,027. This application Apr. 27, 1976, Ser. No. 680,649

Claims priority, application France, Aug. 8, 1973, 73 28972

Int. Cl.[2] C09B *29/08, 29/26;* D06P *3/42, 3/54*

U.S. Cl. 260—158 **6 Claims**

1. A dyestuff of the formula:



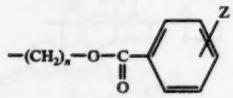
in which

A is thiazolyl, isothiazolyl, benzothiazolyl, benzisothiazolyl, thiadiazolyl, thienyl, or imidazolyl which is unsubstituted or substituted by one to three substituents selected from chlorine, bromine, methyl, phenyl, nitro, cyano, thiocyano, acetyl, carbalkoxy containing 2 to 5 carbon atoms and alkylsulfonyl containing 1 to 4 carbon atoms;

X is hydrogen, chlorine, methyl, ethyl, methoxy, ethoxy, formylamino, acetylamino, propanoylamino, benzoylamino or cinnamoylamino;

Y is hydrogen, methyl, ethyl, methoxy or ethoxy;

R is hydrogen, alkyl containing 1 to 4 carbon atoms or the group of formula:



said alkyl being unsubstituted or substituted by one hydroxy, alkoxy containing 1 to 4 carbon atoms, phenoxy, acetyloxy, cyano, alkylsulfonyl containing 1 to 4 carbon atoms, carbalkoxy containing 2 to 5 carbon atoms or alkoxycarbonyloxy containing 2 to 5 carbon atoms;

n is equal to 1, 2, or 3; and

Z is 2-cyanovinyl, 2-cyanoethyl or 2-chloro-2-cyanoethyl.

4,105,654
LIQUID CRYSTALLINE 4''-CYANO- OR 4''-NITROBENZYLIDENE-4'-(N,N-DIALKYLAMINO)-1-AMINOAZABENZENE DYES

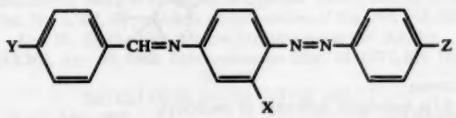
Allen Bloom, East Windsor, and Ling Kong Hung, Edison, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,538

Int. Cl.[2] C07C *107/06;* C09B *29/08;* C09K *3/34*

U.S. Cl. 260—205 **5 Claims**

1. A compound having the formula:



wherein Y and Z are different, one is nitro or cyano and the other is $-N(R)_2$ wherein R is alkyl or alkylene of 1 to 8 carbon atoms, and X is hydrogen, methyl, fluoro or chloro.

4,105,655
PHENYL-AZO-ANILINO DYESTUFF

Alois Gottschlich, and Klaus Leverenz, both of Leverkusen, Germany, assignors to Bayer Aktiengellschaft, Leverkusen, Germany

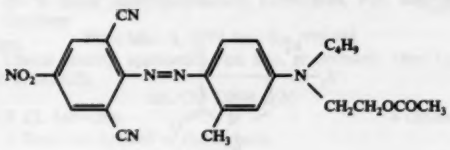
Continuation of Ser. No. 382,063, Jul. 24, 1973, abandoned, which is a division of Ser. No. 361,603, May 18, 1973, Pat. No. 3,962,209, which is a continuation of Ser. No. 28,247, Apr. 17, 1970, abandoned, which is a continuation of Ser. No. 615,898, Feb. 14, 1967, abandoned. This application Mar. 1, 1976, Ser. No. 662,880

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1966, 1648454; Jan. 12, 1967, 1751232; Feb. 17, 1966, 1648455

Int. Cl.[2] C09B *29/06;* D06P *1/18, 3/26, 3/54*

U.S. Cl. 260—207.1 **1 Claim**

1. Dyestuff having the formula



4,105,656
PROCESS FOR PREPARING 3-N-MONOSUBSTITUTED AMINO-4-SUBSTITUTED-5-PYRAZOLONES

Kotaro Nakamura; Seiji Ichijima; Nobuo Furutachi, and Yosio Kosuge, all of ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

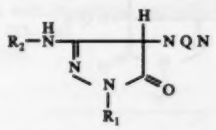
Filed Jan. 31, 1977, Ser. No. 764,481

Claims priority, application Japan, Jan. 30, 1976, 51-8988

Int. Cl.[2] C07D *231/16*

U.S. Cl. 260—239.9 **5 Claims**

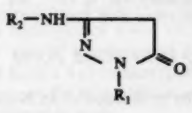
1. A process for preparing a 3-N-mono-substituted amino-4-substituted-5-pyrazolone represented by the formula (VI)



(VI)

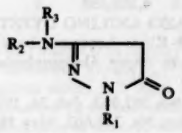
wherein R_1 represents a hydrogen atom or has up to 35 carbon atoms and represents a straight or branched alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, a cycloalkenyl group, an aryl group, a heterocyclic group, an acyl group, a thioacyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkylsulfinyl group, an arylsulfinyl group, a carbamoyl group or a thiocarbamoyl group; R_2 represents a hydrogen atom or has up to 35 carbon atoms and represents an alkyl group, an aryl group or a heterocyclic group; and Q represents a group of nonmetallic atoms necessary to form a 5-membered or 6-membered heterocyclic ring containing two or more nitrogen atoms;

which comprises replacing the hydrogen atom of the N-H group in the 3-position of a compound represented by the formula (I)



(I)

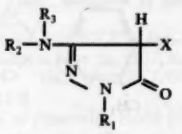
wherein R_1 and R_2 are as described above; with a protective group to prepare a compound represented by the formula (II)



(II)

wherein R_1 and R_2 are as described above, and R_3 has up to 35 carbon atoms and represents a formyl group, an alkyl carbonyl group, an aryl carbonyl group, an alkyl sulfonyl group, an arylsulfonyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbamoyl group, a sulfamoyl group or a thiocarbamoyl group;

halogenating the resulting compound represented by the formula (II) to prepare a compound represented by the formula (III)



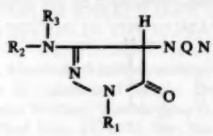
(III)

wherein R_1, R_2 and R_3 are as described above, and X represents a halogen atom;

reacting the resulting compound represented by the formula (III) with a nitrogen-containing heterocyclic compound represented by the formula (IV)

H N Q N (IV)

wherein Q is as described above; to prepared a compound represented by the formula (V)



(V)

wherein R_1, R_2, R_3 and Q are as described above; and converting the resulting compound of the represented by the formula (V) into a compound represented by said formula (VI).

4,105,657

PRODUCTION OF N-ALKYL DERIVATIVES OF CYCLIC ALKYLENIMINES

Toni Dockner, Meckenheim; Herbert Toussaint, Frankenthal, and Martin Decker, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 605,238, Aug. 8, 1975, abandoned, which is a continuation of Ser. No. 330,243, Feb. 7, 1973, abandoned. This application Apr. 8, 1977, Ser. No. 786,116

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1972, 2205597

Int. Cl.[2] C07D *295/02, 265/30*

U.S. Cl. 260—239 B 4 Claims

1. In a process for the production of an N-alkylated cyclic amine of the formula

wherein R is an alkyl radical selected from the group consisting of methyl, ethyl and isopropyl, by reacting in the gas phase at a temperature of from 150° to 350° C an alcohol selected from the group consisting of methanol, ethanol and isopropanol or an ether selected from the group consisting of dimethyl ether, diethyl ether and diisopropyl ether with a cyclic amine of the formula

said latter amine being selected from the group consisting of pyrrolidine, 1-methylimidazolidine, oxazolidine, thiazolidine, dihydroisoindole, piperidine, 3-propylpiperidine, piperazine, N-methylpiperazine, perhydro-(1,3)-oxazine, perhydro-(1,3)-thiazine, hexamethylenimine, perhydrothiazepine, decamethylenimine, 3,5-dimethylmorpholine, and morpholine, in the presence of a catalyst containing a phosphorus compound on a carrier, the improvement which comprises carrying out said reaction in the presence of a silicon dioxide catalyst having a specific surface area of from 50 to 500 m^2/g and containing from 0.1 to 20% by weight of phosphoric acid, said catalyst being obtained by converting an aqueous colloidal sodium silicate solution by addition of sulfuric acid to a silicic acid hydrogel, desalting said hydrogel with ammoniacal water, adding oxalic acid and an appropriate amount of phosphoric acid, milling the mixture so obtained until peptization takes place and spray drying to give a particulate powder.

4,105,658

NEOTHRAMYCIN ANTIBIOTICS

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Masa Hamada, Hoya; Shinichi Kondo, Yokohama; Masaaki Ishizuka, and Hiroshi Naganawa, both of Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

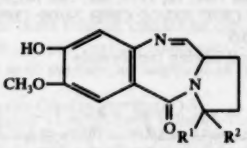
Continuation-in-part of Ser. No. 556,985, Mar. 10, 1975, abandoned. This application Feb. 19, 1976, Ser. No. 659,319

Claims priority, application Japan, Mar. 12, 1974, 49-2767; Oct. 15, 1975, 50-123256

Int. Cl.[2] C07D *487/14;* C12B *1/08;* C12D *9/16*

U.S. Cl. 260—239.3 T 7 Claims

1. A pharmaceutically acceptable salt of a hydroxyl group of a compound of the formula



wherein

R^1 is hydrogen, hydroxyl or methoxyl,

R^2 is hydrogen, hydroxyl or methoxyl, and one but only one of R^1 and R^2 is hydrogen.

4,105,659

1,2,3,4,5,6-HEXAHYDRO-2,6-METHANO-3-BENZAZOCINES

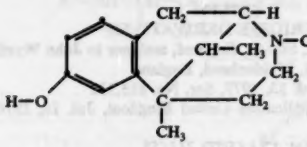
Sydney Archer, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 72,844, Dec. 1, 1960, abandoned, Ser. No. 239,777, Nov. 23, 1962, Pat. No. 3,372,165 and Ser. No. 251,721, Jan. 16, 1963 Pat. No. 3,250,678. This application Feb. 5, 1964, Ser. No. 342,768

Int. Cl.[2] C07D *221/26*

U.S. Cl. 260—293.54 9 Claims

1. 1,2,3,4,5,6-Hexahydro-3-(3-methyl-2-butenyl)-6,11-dimethyl-8-hydroxy-2,6-methano-3-benzazocine having the structural formula



4,105,660

PREPARATION OF 3β-HYDROXY-27-NORCHOLEST-5,7-DIEN-25-ONE

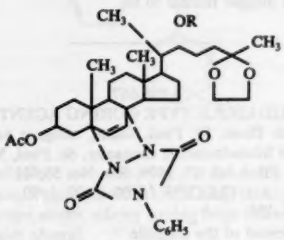
Howard Jones, Holmdel, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 29, 1977, Ser. No. 811,403

Int. Cl.[2] C07J *9/00, 21/00*

U.S. Cl. 260—239.55 C 2 Claims

2. A compound of structural formula:



wherein R is a member selected from the group consisting of hydroxy and mesyl.

4,105,661

2-MERCAPTO, ALKYL, ACETYL AND FURFURYL-SULFIDE PYRAZINES

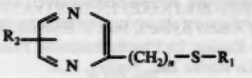
Max Winter, Petit-Lancy; Fritz Gautschi, Commugny; Ivon Flament; Max Stoll, both of Petit-Lancy, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 482,819, Jun. 24, 1974, Pat. No. 4,038,435, which is a division of Ser. No. 243,866, Apr. 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sep. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, Apr. 18, 1966, which is a continuation-in-part of Ser. No. 452,342, Apr. 30, 1965. This application Mar. 23, 1977, Ser. No. 780,558

Int. Cl.[2] C07D *241/12, 241/18, 405/12*

U.S. Cl. 544—405 11 Claims

1. A compound of the formula



wherein n is 0, 1 or 2, R_1 is hydrogen, methyl, ethyl, acetyl or furfuryl and R_2 is hydrogen or methyl with the proviso that R_1 and R_2 cannot both be methyl if n is 0.

4,105,662

ANTRAQUINONE DYESTUFFS

Klaus von Oertzen, Cologne, Fed. Rep. of Germany; Hans Samuel Bien, deceased, late of Burscheid, Fed. Rep. of Germany (by Else Bien, legal representative), and by Gabriele Bien, legal representative, Burscheid, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

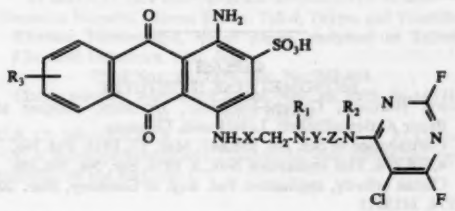
Filed Mar. 9, 1977, Ser. No. 775,894

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610158

Int. Cl.[2] C09B *1/20*

U.S. Cl. 544—294 4 Claims

1. Reactive dyestuff of the formula



wherein

R_1, R_2 and R_3 are hydrogen;

X is phenylene or phenylene substituted with C_1-C_4-alkyl, with or without one sulfo groups;

Y is CO or SO_2; and

Z is phenylene.

4,105,663

THIOPHENE ETHANOLAMINES

Jehan F. Bagli, Kirkland, and Eckhardt Ferdinandi, St. Laurent, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 569,509, Apr. 18, 1975, Pat. No. 4,024,156. This application Feb. 16, 1977, Ser. No. 768,936

Claims priority, application Canada, Apr. 18, 1974, 197896

Int. Cl.[2] C07D *409/02*

U.S. Cl. 544—379 6 Claims

1. A compound of the formula

$$ArCHOR^1CHR^2NR^3R^4$$

in which Ar is selected from the group consisting of 2-thienyl, 5-(lower alkyl)-2-thienyl, 5-phenyl-2-thienyl and 4,5-dichloro-2-thienyl; R^1 is hydrogen or lower alkyl; R^2 is hydrogen or lower alkyl; R^3 and R^4 together with the nitrogen to which they are joined form a 4-(4-methoxyphenyl)-or 4-(o-tolyl)piperazin-1-yl group, or the acid addition salts thereof with pharmaceutically acceptable acids.

4,105,664

DIBENZ[b,f]OXEPIN DERIVATIVES

Max Gerecke; Emilio Kyburz, both of Reinach, Switzerland, and Jean-Pierre Kaplan, Le Plessis Robinson, France, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

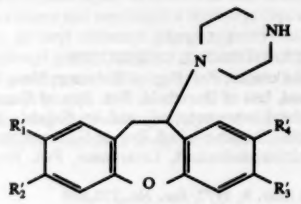
Division of Ser. No. 534,033, Dec. 18, 1974, Pat. No. 4,032,525. This application Mar. 18, 1977, Ser. No. 779,196

Claims priority, application Switzerland, Jan. 4, 1974, 62/74; Nov. 20, 1974, 15369/74

Int. Cl.² C07D *405/04*

U.S. Cl. 544—378 **3 Claims**

1. A compound of the formula



wherein one of R'_1 and R'_2 is hydrogen and the other is halogen, lower alkyl, lower alkoxy, lower alkylthio, or trifluoromethyl, and one of R'_3 and R'_4 is hydrogen and the other is halogen, lower alkyl, lower alkoxy, lower alkylthio, or trifluoromethyl.

4,105,665

MONOMETHINE DYESTUFFS

Horst Harnisch, Cologne-Buchheim, Germany, assignor to Bayer Aktiengellschaft, Leverkusen, Germany

Continuation of Ser. No. 558,647, Mar. 17, 1975, Pat. No. 4,018,796. This application Nov. 3, 1976, Ser. No. 738,356

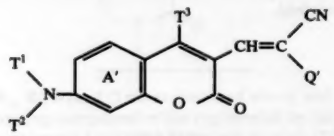
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1974, 2413371

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.² C09B *23/04*

U.S. Cl. 260—289 C **6 Claims**

1. Monomethine dyestuff of the formula



wherein

T^1 and T^2 independently of one another are unsubstituted C_1–C_5-alkyl uninterrupted or interrupted by —O—; C_1–C_4-alkyl monosubstituted or disubstituted by hydroxyl or chlorine; C_1–C_4 alkyl monosubstituted by bromine, nitrile, C_1–C_4-alkoxycarbonyl, aminocarbonyl, phenoxy, benzyloxy, cyclohexyloxy, cyclohexyl, C_1–C_4-alkoxycarbonyloxy, C_1–C_4-alkylcarbonyloxy, acetylamino, C_1–C_4-alkylsulphonylamino, aminocarbonyloxy, di-(C_1–C_4-alkyl) amino, carboxyl or sulpho; cyclohexyl; phenyl-C_1–C_3-alkyl; hydrogen; C_1–C_4-alkyl uninterrupted or interrupted by —O— and substituted by benzyloxycarbonyl, phenoxycarbonyl, phenoxy substituted by 1–5 chlorine atoms, C_1–C_4-alkylsulphonyl, benzylsulphonyl, phenylsulphonyl, benzylcarbonyloxy, benzoyloxy, C_1–C_4-alkoxycarbonyl-benzoyloxy, phenoxycarbonyloxy, tri-(C_1–C_4-alkyl) ammonium, benzoylamino, phenylaminocarbonylamino, phenylsulphonylamino or toluenesulphonylamino; or ethylene or 1,3-propylene unsubstituted or substituted with C_1–C_3-alkyl and connected to the 6- or 8-position of the coumarin ring;

T^3 is hydrogen or methyl;

Q' is CN or COOR;

R is C_1–C_6-alkyl; C_1–C_4-alkyl substituted by hydroxyl, C_1–C_4-alkoxy, nitrile, chlorine, bromine, benzyloxy, phenoxy, cyclohexyloxy, di-(C_1–C_4-alkyl)amino, N-tri-(C_1–C_4-alkyl) ammonium, or phenyl; or is allyl, cyclohexyl or phenyl; and

the ring A' is unsubstituted or substituted by methoxy, methyl or chloromethyl.

4,105,666

PIPERIDINE DERIVATIVES

Terence James Ward, Slough, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

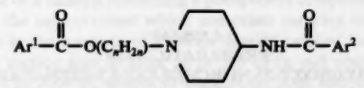
Filed Jul. 13, 1977, Ser. No. 815,131

Claims priority, application United Kingdom, Jul. 16, 1976, 29419/76

Int. Cl.² C07D *211/58*

U.S. Cl. 260—293.77 **3 Claims**

1. A compound selected from those having the formula I



and their pharmaceutically acceptable acid addition salts, wherein Ar^1 and Ar^2 are independently selected from the group consisting of phenyl and phenyl substituted by one or two substituents selected from halogen, lower alkyl, lower alkoxy, nitro, trifluoromethyl and di(lower alkyl) amino; and *n* represents an integer from 2 to 6.

4,105,667

IMIDAZOLE TYPE CURING AGENTS

Karl Friedrich Thom, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 17, 1970, Ser. No. 55,981

Int. Cl.² C07F *15/00, 3/00, 1/00*

U.S. Cl. 260—299 **5 Claims**

1. A compound of the formula

$$ML_n(O—SO_2—R_f)_m$$

wherein

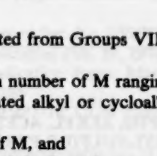
M is a metal selected from Groups VIII, IB and IIB of the Periodic Table,

n is a coordination number of M ranging from 2 to 8,

R_f is a perfluorinated alkyl or cycloalkyl group of 1 – 18 carbon atoms,

m is the valence of M, and

L is an imidazole of the formula



wherein

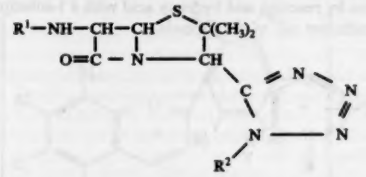
R_1, R_2, and R_3 are the same or different and are selected from the group consisting of hydrogen, phenyl, methyl, benzyl and ethyl.

4,105,668
PROCESS FOR 6-AMINO-2,2-DIMETHYL-3-(5-TETRAZOLYL)PENAM

Susumu Nakanishi, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 540,127, Jan. 10, 1975, abandoned. This application Apr. 22, 1977, Ser. No. 790,021
Int. Cl.[2] C07D *499/08*
U.S. Cl. 260—306.7 R 10 Claims

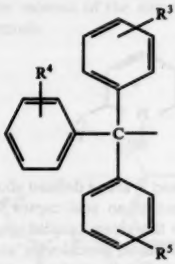
1. A process for the preparation of 6-amino-2,2-dimethyl-3-(5-tetrazolyl)penam, or an acid-addition salt thereof, which comprises reacting a compound of formula



or an acid-addition salt thereof, with hydrogen fluoride, at a temperature within the range from about −20° C. to about 20° C;

wherein

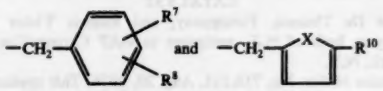
R^1 is selected from the group consisting of hydrogen and



wherein

R^3, R^4, and R^5 are each selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms and phenyl;

and R^2 is selected from the group consisting of



wherein

R^7 is at the 3-, 4- or 5-position and it is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, alkyl having from one to six carbon atoms, alkoxy having from one to six carbon atoms, benzyloxy and phenyl;

R^8 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, unbranched-alkyl having from one to six carbon atoms and unbranched-alkoxy having from one to six carbon atoms;

R^{10} is selected from the group consisting of hydrogen and methyl;

and X is selected from the group consisting of oxygen and sulfur;

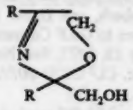
provided that at least one of R^7 and R^8 is selected from the group consisting of 2-hydroxy, 4-hydroxy, 4-alkoxy having from one to six carbon atoms, 2-(unbranched-alkoxy) having from one to six carbon atoms and 4-benzyloxy .

4,105,669
MANUFACTURE OF 2-AMINO-1-ALCOHOLS

Walter Himmele, Walldorf; Leopold Hupfer, Friedelsheim; Herbert Toussaint, Frankenthal, and Gerhard Paul, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland, Pfalz, Fed. Rep. of Germany

Division of Ser. No. 730,828, Oct. 8, 1976. This application Jun. 20, 1977, Ser. No. 807,925
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1975, 2547654
Int. Cl.[2] C07D *263/14;* C07C *85/145, 85/20*
U.S. Cl. 260—307 F 2 Claims

1. A compound of the formula



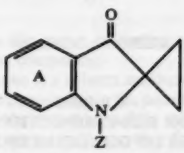
where R is methyl, ethyl, n-propyl or n-butyl.

4,105,670
SPIRO[CYCLOPROPANE-1,2'-INDOLIN]-3'-ONES

Shunsaku Noguchi, Minoo; Saburo Takei, Tokyo, and Yasuhiko Kawano, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Nov. 19, 1976, Ser. No. 743,404
Claims priority, application Japan, Nov. 26, 1975, 50-141748
Int. Cl.[2] C07D *209/04*
U.S. Cl. 260—326.11 R 32 Claims

1. A spiro[cyclopropane-1,2'-indolin]-3'-one compound represented by the formula:



wherein the ring A is unsubstituted or substituted with an alkyl of 1 to 4 carbon atoms, an alkoxy having 1 to 4 carbon atoms, an alkylenedioxy having 1 to 4 carbon atoms, hydroxyl, nitro, amino, formylamino, an alkylcarbonyl amino having 2 to 5 carbon atoms, an arylcarbonyl amino having 7 to 11 carbon atoms or halogen; and Z is selected from the group consisting of

(A) hydrogen;

(B) a substituted or unsubstituted alkyl of 1 to 4 carbon atoms, wherein the substituent is selected from the group consisting of an aryl group of 6 to 10 carbon atoms, which aryl group may be further substituted with halogen, an alkyl group of 1 to 4 carbon atoms or an alkoxy group of 1 to 4 carbon atoms; an alkylcarbonyl group having 2 to 5 carbon atoms; formyl; a halogen-substituted or unsubstituted arylcarbonyl group having 7 to 11 carbon atoms; an alkoxy group having 1 to 4 carbon atoms; hydroxyl; an alkoxycarbonyl group having 2 to 5 carbon atoms; carboxyl; an N-substituted or unsubstituted carbamoyl group of the formula -CONPQ wherein each of P and Q is hydrogen or an alkyl group having 1 to 4 carbon atoms; or an amino or a mono- or di-alkylamino group, wherein each alkyl has 1 to 4 carbon atoms; and

(C) an unsubstituted acyl group of the formula: R^1CO-, R^2SO_2- or R^3R^4NCO in which R^1 is hydrogen, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having

1 to 4 carbon atoms or an aryl group having 6 to 10 carbon atoms and R^2 is an alkyl group having 1 to 4 carbon atoms or an aryl group having 6 to 10 carbon atoms, and each of R^3 and R^4 is hydrogen, an alkyl group having 1 to 4 carbon atoms or an aryl group having 6 to 10 carbon atoms, or a substituted acyl group thereof wherein the substituent of the acyl group is amino; a mono- or di-alkylamino wherein the alkyl has 1 to 4 carbon atoms; halogen; an alkyl group having 1 to 4 carbon atoms or an alkoxy group having 1 to 4 carbon atoms, or

pharmaceutically acceptable salts of said compound.

4,105,671

INSECTICIDAL N-METHYLPYRROLIDINONYLACETANILIDES

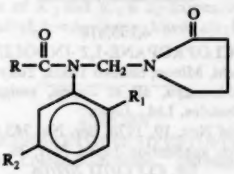
Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed May 13, 1977, Ser. No. 796,520

Int. Cl.² C07D *207/26*

U.S. Cl. 260—326.43 **5 Claims**

1. Insecticidal N-acyl-N-(N'-methylenepyrrolidonyl) -2,5 dialkylanilines having the formula:



where R_1 and R_2 are both lower alkyl, and R is selected from alkyl, alkenyl and haloalkenyl having from 2 to 12 carbon atoms.

4,105,672

PROCESS FOR THE PRODUCTION OF CYCLIC DIESTERS OF DODECANEDIOIC ACID

Joern Rueter; Klaus Burzin; Karl-Heinz Magosch, and Roland Feinauer, all of Marl, Germany, assignors to Chemische Werke Huels Aktiengellschaft, Marl, Germany

Filed Oct. 19, 1976, Ser. No. 734,013

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1975, 2547267

Int. Cl.² C07D *321/00*

U.S. Cl. 260—340.2 **14 Claims**

1. In a process for the production of a cyclic ester of dodecanedioic acid and an aliphatic diol of 2–12 carbon atoms and substituted by up to two alkyl of 1–4 carbon atoms, by thermolysis of a corresponding linear polyester under reduced pressure in the presence of a catalyst, the improvement which comprises conducting the thermolysis at a temperature of from 200° to 300° C., and employing as the catalyst a mixture of an organotin compound of the formula

wherein R_1 and R_2 are each alkyl of 1–18 carbon atoms, or aryl or aralkyl of 6–36 carbon atoms, and an O,O-dialkyl-(3,5-di-tert.-butyl-4-hydroxybenzyl)phosphonate wherein each alkyl is of 2–18 carbon atoms.

4,105,673

PROCESS FOR THE PREPARATION OF LACTONES

Teruaki Mukaiyama; Masahiro Usui, both of Tokyo, and Kazuhiko Saigo, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

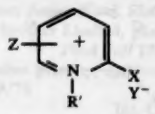
Filed Sep. 20, 1976, Ser. No. 724,845

Claims priority, application Japan, Jan. 13, 1976, 51-3557

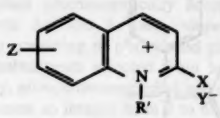
Int. Cl.² C07D *313/00*

U.S. Cl. 260—343 **6 Claims**

1. A process for producing a lactone which comprises subjecting a hydroxy acid of the formula R-COOH wherein R is a saturated or olefinically unsaturated hydroxy acyclic group optionally substituted with cycloalkyl to intramolecular condensation by reacting said hydroxy acid with a 1-substituted-2-halopyridinium salt of the formula



wherein R' is C_{1-C6} alkyl, allyl, C_3–C_6 cycloalkyl-(C_1–C_2) alkyl, 2-oxo-(C_2–C_6)alkyl, phenyl-(C_1–C_6)alkyl or phenyl-substituted 2-oxo-(C_2–C_6)alkyl; X is halogen; Y^- is a halide ion, a methylsulfate ion, a p-toluenesulfonate ion, a perchlorate ion or a tetrafluoroborate ion; and Z is C_1–C_6 alkyl, nitro, halogen or C_1–C_6 alkoxy, or a 1-substituted-2-haloquinolinium salt of the formula



wherein R', X, Y^- and Z are as defined above, as a condensing agent in the presence of an acid captor for acids having an anion selected from the group consisting of halogen, methylsulfate, p-toluenesulfonate, perchlorate and tetrafluoroborate in an anhydrous organic solvent at a temperature from 0° C to the boiling point of said solvent.

4,105,674

PRODUCTION OF GAMMA-BUTYROLACTONE FROM MALEIC ANHYDRIDE WITH A HYDROGENATION CATALYST

Waldo De Thomas, Parsippany, and Eugene Victor Hort, Wayne, both of N.J., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 716,111, Aug. 20, 1976. This application Mar. 9, 1977, Ser. No. 775,792

Int. Cl.² C07D *307/32*

U.S. Cl. 260—343.6 **9 Claims**

1. A process for producing gamma-butyrolactone, comprising contacting a feed compound selected from the group consisting of maleic acid, succinic acid, maleic anhydride, succinic anhydride, mixtures thereof, and mixtures of any of the foregoing with butyrolactone; in the vapor phase, with a stoichiometric excess of hydrogen at a pressure ranging from atmospheric to about 50 atmospheres and at a temperature between about 150° C. and about 350° C. in the presence of an elemental copper-elemental metal catalyst comprising about 3 – 100 percent by weight of an admixture of elemental copper and an elemental metal selected from the group consisting of palladium and platinum, the weight ratio of copper to said elemental metal ranging from about 10:1 to about 500:1, the rest of said admixture being a non-acidic carrier.

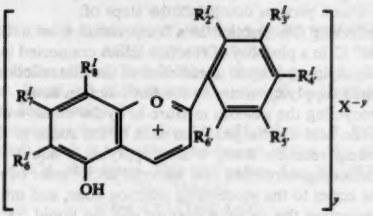
4,105,675

METHOD FOR MAKING 3-DEOXYANTHOCYANIDINS

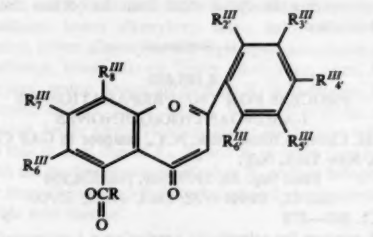
Guillermo A. Iacobucci, and James G. Sweeny, both of Atlanta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Mar. 1, 1976, Ser. No. 662,742
Int. Cl.[2] C07D *311/60;* A23L *1/275*
U.S. Cl. 260—345.2 56 Claims

1. A method for preparing a 3-deoxyanthocyanidin salt of the formula:



wherein $R_{6\text{-}8,3'\text{-}5'}{}^{I}$ are substituents selected from the group consisting of H, non-vicinal OH and lower alkoxy, at least one of $R_7{}^{I}$ and $R_4{}^{I}$, is OH, $R_2{}^{I}$ and $R_6{}^{I}$, are substituents selected from the group consisting of H and lower alkoxy, X is an anion and y corresponds to the valence of the anion, from an acylated flavanone of the formula:



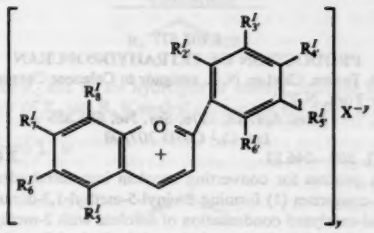
wherein $R_{6\text{-}8,2'\text{-}6'}{}^{III}$ are the same as $R_{6\text{-}8,2'\text{-}6'}{}^{I}$ except that those $R_{6\text{-}8,3'\text{-}5'}{}^{III}$ corresponding to those $R_{6\text{-}8,3'\text{-}5'}{}^{I}$ which are OH are

and is selected from the group consisting of lower alkyl and phenyl, said method comprising:

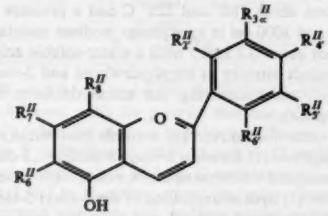
(a) reducing said acrylated flavanone in an organic solvent medium by reaction with an alkali borohydride to form a flavan not having a 4-OH substituent and

(b) oxidizing said flavan or an acylated or hydrolyzed derivative thereof in a solvent medium by reaction with a halogenated benzoquinone in the presence of a strong acid to form said 3-deoxyanthocyanidin salt, said solvent medium of this step and said strong acid together forming an aqueous protic medium.

36. A method for preparing a 3-deoxyanthocyanidin said of the formula:



wherein $R_{5\text{-}8,3'\text{-}5'}{}^{I}$ are substituents selected from a group consisting of H, non-vicinal OH and lower alkoxy, at least one of $R_7{}^{I}$ and $R_4{}^{I}$ is OH, $R_2{}^{I}$ and $R_6{}^{I}$ are substituents selected from a group consisting of H and lower alkoxy, X is an anion and y corresponds to the valence of the anion from a flavan of the formula:



wherein $R_{5\text{-}8,2'\text{-}6'}{}^{II}$ are the same as $R_{5\text{-}8,2'\text{-}6'}{}^{I}$ except that those $R_{5\text{-}8,3'\text{-}5'}{}^{II}$ corresponding to those $R_{5\text{-}8,3'\text{-}5'}{}^{I}$ which are OH are OH or

R is selected from the group consisting of lower alkyl and phenyl, said method comprising

oxidizing said flavan in a solvent medium by reaction with a halogenated benzoquinone in the presence of a strong acid to form said 3-deoxyanthocyanidin salt, said solvent medium and said strong acid together forming an aqueous protic medium.

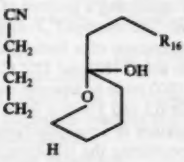
4,105,676

STEROID TOTAL SYNTHESIS PROCESS UTILIZING A CYANOALKYL A-RING PRECURSOR

Noal Cohen, Montclair; Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 642,817, Dec. 22, 1975, Pat. No. 4,045,452, which is a division of Ser. No. 450,701, Mar. 18, 1974, Pat. No. 3,991,084, which is a division of Ser. No. 67,296, Aug. 26, 1970, Pat. No. 3,813,417. This application May 10, 1977, Ser. No. 795,577
Int. Cl.[2] C07D *309/06*
U.S. Cl. 260—345.9 S 2 Claims

1. A compound of the formula



where R_{16} is lower alkoxy.

4,105,677

PRODUCTION OF TETRAHYDROFURAN

Paul D. Taylor, Clinton, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,355
Int. Cl.² C07D *307/08*
U.S. Cl. 260—346.11 3 Claims

1. A process for converting acrolein into tetrahydrofuran which comprises (1) forming 2-vinyl-5-methyl-1,3-dioxane by the acid-catalyzed condensation of acrolein with 2-methyl-1,3-propanediol; (2) hydroformylation of the 2-vinyl-5-methyl-1,3-dioxane with carbon monoxide and hydrogen in the presence of a hydroformylation catalyst at a temperature between about 25° and 200° C and a pressure between about 15 and 300 psi to produce a mixture of 2-(5′-methyl-1′,3′-dioxane)propionaldehyde and 3-(5′-methyl-1′,3′-dioxane)propionaldehyde; and (3) hydrogenating said mixture of propionaldehydes with hydrogen in the presence of a hydrogenation catalyst at a temperature between about 180° and 225° C and a pressure between about 100 and 1000 psi in an aqueous medium maintained at a pH between about 0.2 and 3 with a water-soluble acid to produce a product mixture of tetrahydrofuran and 2-methyl-1,3-propanediol, and recovering the tetrahydrofuran from the product mixture.

3. A process for converting acrolein into tetrahydrofuran which comprises (1) forming 2-vinyl-5-methyl-1,3-dioxane by the acid-catalyzed condensation of acrolein with 2-methyl-1,3-propanediol; (2) hydroformylation of the 2-vinyl-5-methyl-1,3-dioxane with carbon monoxide and hydrogen in the presence of a hydroformylation catalyst at a temperature between about 80° and 120° C and a pressure between about 300 and 3000 psi to produce a mixture of 2-(5′-methyl-1′,3′-dioxane)propionaldehyde and 3-(5′-methyl-1′,3′-dioxane)propionaldehyde, and increasing the temperature into the range between about 150° and 225° C to convert the propionaldehydes into a mixture of 2-(5′-methyl-1′,3′-dioxane)propanol and 3-(5′-methyl-1′,3′-dioxane)propanol; and (3) hydrogenating said mixture of propanols with hydrogen in the presence of a hydrogenation catalyst at a temperature between about 180° and 225° C and a pressure between about 100 and 1000 psi in an aqueous medium maintained at a pH between about 0.2 and 3 with a water-soluble acid to produce a product mixture of tetrahydrofuran and 2-methyl-1,3-propanediol, and recovering the tetrahydrofuran from the product mixture.

4,105,678

SYNTHESIS OF TETPAHYDROFURAN

Paul D. Taylor, Clinton, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,343
Int. Cl.² C07D *307/08*
U.S. Cl. 260—346.11 4 Claims

1. A process which comprises contacting 3-(5′-alkyl-1′,3′-dioxane)propionaldehyde with hydrogen in the presence of a hydrogenation catalyst at a temperature between about 180° C and 225° C and a pressure between about 100 and 1000 psi in an aqueous medium maintained at a pH between about 0.2 and 3 with a water-soluble acid to produce tetrahydrofuran, and recovering the said tetrahydrofuran from the reaction mixture.

4. A process which comprises contacting a mixture of 3-(5′-methyl-1′,3′-dioxane)propanol and 2-(5′-methyl-1′,3′-dioxane)-propanol with hydrogen in the presence of a hydrogenation catalyst at a temperature between about 180° and 225° C and a pressure between about 100 and 1000 psi in an aqueous medium maintained at a pH between about 0.2 and 3 with a water-soluble acid to produce a product mixture of tetrahydrofuran and 2-methyl-1,3-propanediol, and recovering the tetrahydrofuran from the product mixture.

4,105,679

PROCESS FOR PRODUCING A CYLIC ETHER FROM AN ACETIC ESTER OF A 1,4-GLYCOL

Yasuo Tanabe, Kurashiki, Japan, assignor to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Jan. 28, 1977, Ser. No. 763,715
Claims priority, application Japan, Feb. 4, 1976, 51-11077; Mar. 16, 1976, 51-28451
Int. Cl.² C07D *307/08*
U.S. Cl. 260—346.11 13 Claims

1. A process for producing a cyclic ether by reacting an acetic ester of 1,4-butanediol or 1,4-dihydroxybutene-2 and water in the presence of a non-volatile liquid acid catalyst and recovering the cyclic ether from the reaction product by distillation, which process comprises the steps of:

(a) effecting the reaction at a temperature from 110° C. to 180° C. in a plurality of reaction zones connected in series,
(b) supplying the liquid acetic ester to the first reaction zone, while supplying water to the last reaction zone,
(c) recycling the gaseous mixture of cyclic ether, water and acetic acid discharged from each of the zones to the preceding reaction zone, while supplying a liquid fraction containing unreacted raw material acetic ester of each of the zones to the succeeding reaction zone, and intimately contacting the gaseous mixture and the liquid fraction in each reaction zone,
(d) removing the liquid fraction from the last reaction zone,
(e) supplying the gaseous mixture of cyclic ether water and acetic acid discharged from the first reaction zone to a distillation column,
(f) recycling the gaseous mixture of cyclic ether and water discharged from the distillation column to a predetermined reaction zone,
(g) removing the bottom residue containing cyclic ether substantially free from water discharged from the distillation column, and
(h) recovering the cyclic ether from the bottom residue by distillation.

4,105,680

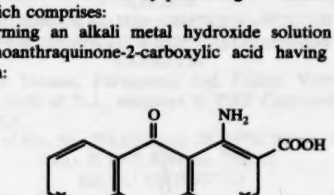
PROCESS FOR THE PREPARATION OF 1-AMINOANTHRAQUINONES

Rack H. Chung, Clifton Park, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Sep. 20, 1977, Ser. No. 834,994
Int. Cl.² C09B *1/22*; C07C *49/68, 25/00*
U.S. Cl. 260—378 9 Claims

1. A process for selectively producing a 1-aminoanthraquinone which comprises:

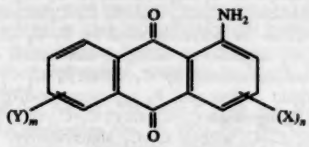
(a) forming an alkali metal hydroxide solution of a 1-aminoanthraquinone-2-carboxylic acid having the formula:



wherein X is hydroxy, alkoxy of from 1 to 4 carbon atoms, halo, amino or —SO_3H; Y is hydroxy, alkoxy of from 1 to 4 carbon atoms, halo, amino or —SO_3H; and m and n independently represent a value of from 0 to 2;

(b) contacting the resulting alkali metal hydroxide solution from (a) with between about 0.75 mole and about 3 moles of an alkali metal hydrosulfite, per mole of 1-aminoanthraquinone-2-carboxylic acid to effect decarboxylation at an elevated temperature; and

(c) recovering the corresponding product of the process having the formula:



wherein the substituents X and Y and subscripts *m* and *n* are the same as defined above.

4,105,681

9-PHENYL 5,6-DIMETHYL-NONA-2,4,6,8-TETRAENOIC ACID COMPOUNDS

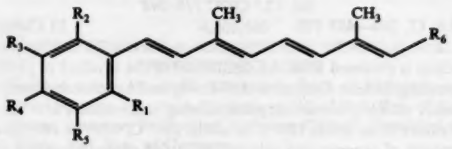
Werner Bollag, Basel; Rudolf Ruegg, Bottmingen, and Gottlieb Ryser, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 601,148, Aug. 1, 1975, abandoned, which is a continuation-in-part of Ser. No. 454,007, Mar. 22, 1974, abandoned. This application Aug. 13, 1976, Ser. No. 714,170

Int. Cl.[2] C09F *5/00*

U.S. Cl. 260—404 **18 Claims**

1. A compound of the formula



wherein R_1 and R_2 are lower alkyl; R_3 is hydrogen, lower alkyl, lower alkoxy, lower alkenyloxy, nitro, halo, amino, lower alkylamino, lower alkanoylamino R_4 is hydrogen, lower alkyl, lower alkenyl, lower alkoxy, lower alkenyloxy, nitro, lower alkanoyloxy, amino, lower alkylamino R_5 is hydrogen, lower alkyl, lower alkenyl, lower alkoxy, lower alkenyloxy, nitro, halo, amino, lower alkanoylamino, lower alkylamino with the proviso that at least one of R_3, R_4 and R_5 is other than hydrogen; with the further proviso that when R_3 or R_5 is halogen, R_4 is other than alkoxy; and R_6 is carboxyl and pharmaceutically acceptable salts thereof.

4,105,682

13,14-DIHYDRO-9-DEOXY-PGF$_2$ COMPOUNDS

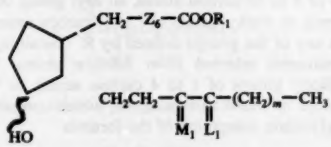
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,243, Sep. 17, 1975, Pat. No. 4,033,989. This application Apr. 11, 1977, Ser. No. 786,699

Int. Cl.[2] C07C *177/00*

U.S. Cl. 260—408 **25 Claims**

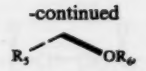
1. A prostaglandin analog of the formula



wherein m is one to 5, inclusive; wherein M_1 is

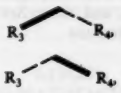
or

-continued

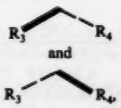


wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and

wherein Z_6 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2— or

(2) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,

wherein *g* is one, 2, or 3.

4,105,683

METHOD OF PREPARATION OF TRIVALENT PLUTONIUM FORMIATE

Michel Germain, Marcoussis, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 17, 1977, Ser. No. 797,796

Claims priority, application France, May 25, 1976, 76 15826

Int. Cl.[2] C07F *5/00*

U.S. Cl. 260—429.1 **10 Claims**

1. A method of preparation of trivalent plutonium formiate, wherein a nitric acid solution having a nitric acid concentration within the range of 0.01 to 15M and containing plutonium-(III) ions and/or plutonium(IV) ions is reacted with a formic acid solution in order to obtain a precipitate of plutonium(III) formiate.

4,105,684

PROCESS FOR THE PREPARATION OF ORGANOTIN TRIHALIDES

Ronald E. Hutton, Southport; Vincent Oakes, St. Helens, and Joseph Burley, New Brighton, all of England, assignors to Akzo N.V., Arnhem, Netherlands

Division of Ser. No. 613,434, Sep. 15, 1975. This application May 3, 1977, Ser. No. 793,363

Claims priority, application Netherlands, Sep. 16, 1974, 7412230

Int. Cl.[2] C07F *7/22*

U.S. Cl. 260—429.7 **5 Claims**

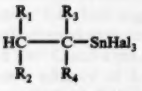
1. A process for the preparation of organotin trihalides which comprises reacting in a polar solvent a

stannous halide,

hydrogen halide and

an olefin of the formula

where R_1, R_2, R_3 and R_4 represent an alkyl group with 1–18 carbon atoms, an oxygen-containing hydrocarbon group or a hydrogen atom, provided that at least one of R_1 and R_2 contains a carbonyl group adjacent to the olefinic double bond, and thereafter isolating the reaction product with the formula



from the medium.

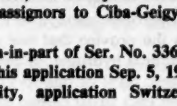
4,105,685

AGENT FOR THE REGULATION OF PLANT GROWTH

Werner Fory, Basel, and Hanspeter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 336,572, Feb. 28, 1973, abandoned. This application Sep. 5, 1974, Ser. No. 503,429
Claims priority, application Switzerland, Mar. 2, 1972, 3048/72
Int. Cl.[2] C07F *7/10, 7/18, 7/08*
U.S. Cl. 260—448.2 N 14 Claims

1. A β-halogenoethyl-silane of formula I



(I)

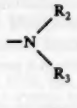
wherein

A represents a radical —S—R_1 or

B represents a radical —SR_1,

or —OR_4,

C represents a radical —SR_1,



,

—OR_4 the methyl or benzyl group, and

X represents chlorine or bromine,

whereby the radical R_1 represents C_1–C_{18} alkyl; C_1–C_{18} alkyl substituted by C_1–C_8 alkoxycarbonyl, phenyl or C_3–C_{12} cycloalkyl; C_3–C_{18} alkenyl; C_3–C_8 alkynyl; C_3–C_{12} cycloalkyl; C_3–C_{12} cycloalkenyl; phenyl optionally mono- or polysubstituted by C_1–C_8 alkyl, C_1–C_8 alkoxy, C_1–C_8 alkylthio or halogen; and benzyl optionally mono- or polysubstituted by C_1–C_8 alkyl, C_1–C_8 alkoxy, C_1–C_8 alkylthio or halogen; R_3 represents C_1–C_{18} alkyl which can be substituted by C_1–C_8 alkoxy, C_1–C_8 alkylthio, phenyl or C_3–C_{12} cycloalkyl; C_3–C_{12} cycloalkyl; C_3–C_{12} cycloalkenyl; C_3–C_{18} alkenyl, C_3–C_8 alkynyl; phenyl optionally mono- or polysubstituted by C_1–C_8 alkyl, C_1–C_8 alkoxy, C_1–C_8 alkylthio or halogen; and benzyl optionally mono- or polysubstituted by C_1–C_8 alkyl, C_1–C_8 alkyloxy, C_1–C_8 alkylthio or halogen; R_2 represents hydrogen or the same as R_3; R_4 represents C_1–C_{18} alkyl; C_1–C_{18} alkyl substituted by halogen, C_1–C_8 alkoxy C_1–C_8 alkoxyalkoxy, C_3–C_6 alkenyloxy, phenoxy, C_3–C_{12} cycloalkyl, C_1–C_8 alkylthio or C_1–C_8 alkoxycarbonyl; C_3–C_{18} alkenyl; C_3–C_{18} halogenoalkenyl; C_3–C_8 alkynyl; C_3–C_{12} cycloalkyl; C_3–C_{12} cycloalkenyl; phenyl radicals optionally mono- or polysubstituted by cyano, nitro, C_1–C_8 alkyl, C_1–C_5 halogenoalkyl, C_1–C_8 alkoxy, C_1–C_8 alkylthio, or C_1–C_8 alkoxycarbonyl; and benzyl radicals optionally mono- or polysubstituted by C_1–C_8alkyl, C_1–C_8alkoxy or halogen.

4,105,686

PROCESS FOR DEACTIVATING TOLUENE DIISOCYANATE DISTILLATION RESIDUE

Maurice C. Raes, Branford, and Pierrepont Adams, Darien, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 15, 1977, Ser. No. 806,806
Int. Cl.[2] C07C *119/048*
U.S. Cl. 260—453 PH 11 Claims

1. A process for converting into an inert solid the residue which is obtained from the distillation of the product of phosgenating toluene diamine to the corresponding toluene diisocyanate, which process comprises mixing said residue, at a temperature from about 120° C to about 180° C, with an effective amount of organic acid selected from the group consisting of oxalic acid, citric acid, and a monocarboxylic acid represented by the formula:

RCOOH

wherein R is hydrogen or an alkyl group having from 1 to 8 carbon atoms.

4,105,687

CYANOETHYLATION OF GLYCOLIC ESTERS

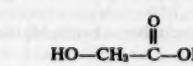
Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 27, 1977, Ser. No. 763,279
Int. Cl.[2] C07C *120/00, 121/16*
U.S. Cl. 260—465.4 7 Claims

1. A process for preparing a compound of the formula

N≡C-CH_2-CH_2-O-CH_2COOR'

wherein R' is an alkyl group of 1 to 10 carbon atoms, a cycloalkyl group of 5 to 10 carbon atoms, an aryl group of 6 to 12 carbon atoms, an aralkyl group of 7 to 10 carbon atoms, or R'' and R'' is any of the groups defined by R' containing one or more substituents selected from halogen atoms, hydroxy groups, alkoxy groups of 1 to 4 carbon atoms, or hydroxy alkoxy groups of 1 to 4 carbon atoms, which comprises contacting a glycolate compound of the formula



wherein R' is as defined above, with acrylonitrile in the presence of a metallic alkoxide under anhydrous conditions.

4,105,688

PROCESS FOR THE PRODUCTION OF MALONIC ACID DINITRILE AND PURIFICATION THEREOF

Urs Arni, Brig; Adriano Faucci, and August Stocker, both of Visp, all of Switzerland, assignors to Lonza, Ltd., Valais, Switzerland

Division of Ser. No. 822,724, May 7, 1969, Pat. No. 3,655,721. This application Apr. 26, 1971, Ser. No. 137,592

Claims priority, application Switzerland, May 9, 1968, 6964/68; Jun. 18, 1968, 9059/68; Jun. 24, 1968, 9383/68

Int. Cl.[2] C07C *120/00, 121/22;* B01D *3/34*

U.S. Cl. 260—465.8 R 14 Claims

1. A method for purifying malononitrile containing as contaminants similarly boiling dienophiles formed in the preparation thereof containing a mixture of maleic acid dinitrile and fumaric acid dinitrile which comprises contacting the impure malononitrile with a member selected from the group consisting of butadiene, isoprene, dimethylbutadiene, piperylene, anthracene, perylene, furan and sorbic acid to effect adduction of said dienophiles and thereupon distilling the adduction reaction mixture to recover an overhead malononitrile fraction having a substantially reduced content of said dienophiles.

2. A method in accordance with claim 1 wherein said impure molononitrile is in the crude form thereof resulting from the reaction of acetonitrile and cyanogen chloride.

4,105,689

PRODUCTION OF N-SUBSTITUTED 2-CARBAMOYL PHOSPHINIC ACIDS

Eberhard Auer; Alexander Oborodnik, both of Erftstadt, and Paul Stutzke, Bornheim-Walberberg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

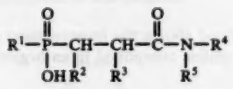
Filed Oct. 25, 1977, Ser. No. 845,349

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648005

Int. Cl.[2] C07F *9/30, 9/34*

U.S. Cl. 260—502.5 6 Claims

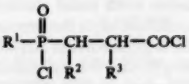
1. A process for making N-substituted 2-carbamoyl phosphinic acids of the general formula:



(I)

in which R^1 stands for an alkyl group having 1 to 4 carbon atoms or an aryl group; R^2 and R^3 stand independently of each other for an alkyl group having 1 to 4 carbon atoms, an aryl group or a hydrogen atom; R^4 stands for an alkyl group having 1 to 18 carbon atoms, an aryl group or a hydrogen atom; and R^5 stands for an alkyl group having 1 to 18 carbon atoms or an aryl group, which process comprises:

reacting, at a temperature of 120° to 170° C, a 2-chloroformyl phosphinic acid chloride of the general formula

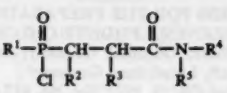


(II)

with an amine of the general formula

(III)

and hydrolyzing with water the resulting N-substituted 2-carbamoyl phosphonic acid chloride of the general formula



the latter compound being obtained while hydrogen chloride is split off.

4,105,690

PROCESS FOR MANUFACTURING N-ACYL DERIVATIVES OF HYDROXY-ARYLGLYCINES

Yani Christidis, Paris, and Alain Schouteten, Villiers le Bel, both of France, assignors to Nobel Hoechst Chimie, Puteaux, France

Filed Sep. 10, 1976, Ser. No. 722,284

Claims priority, application France, Sep. 12, 1975, 75 28151; Jan. 16, 1976, 76 01178

Int. Cl.[2] C07C *102/00, 103/30, 103/46, 103/66*

U.S. Cl. 260—519 7 Claims

1. In a process of manufacturing N-acyl derivatives of hydroxyarylglycines by condensation of the adduct product of glyoxylic acid and amides with hydroxyaryl compounds having at least one free hydroxyl group and with at least one free position at the ortho or para position to the hydroxyl group, the improvement

wherein said process comprises first reacting with heating at a temperature below about 60° C an aliphatic amide having at most 4 carbon atoms, with an aqueous solution of glyoxylic acid;

then, after the addition of acetic acid and gaseous hydrochloric acid, condensing at low temperature below about 35° C the product resulting from the first step, which is the carboxamidoglycolic acid, with an excess of said hydroxyaryl compound; and

isolating the resulting N-acyl hydroxyarylglycine derivative.

4,105,691

PROCESS FOR THE PRODUCTION OF CHLOROFLUORINATED CARBOXYLIC ACIDS

Richard F. Sweeney, Elma; James O. Peterson, Snyder; Bernard Sukornick, Williamsville; Henry R. Nychka, East Aurora; Richard E. Eibeck, Orchard Park, all of N.Y., and Morris B. Berenbaum, Summit, N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 22, 1975, Ser. No. 642,834

Int. Cl.[2] C07C *51/24, 51/26*

U.S. Cl. 260—530 R 52 Claims

1. The process for the production of chlorofluorinated carboxylic acids which comprises reacting a gaseous mixture of a starting material selected from a saturated, aliphatic, carboxy containing compound, a saturated aliphatic carboxylic acid halide and a saturated aliphatic aldehyde in which all atoms are selected from C, H and O, and corresponding hydrohalogenated compounds in which the halo atoms are selected from chloro and fluoro, or mixtures thereof, oxygen in an oxygen-containing gas, HCl or Cl_2 and HF, in the presence of a Deacon catalyst supported by a stable, inert metal salt carrier, with the weight percentage of cation in the Deacon catalyst ranging from about 0.6–20 based on the total cation content of the Deacon catalyst and metal salt carrier, at elevated temperatures and with a contact line of from about 0.1–20 seconds.

4,105,692
PROCESS FOR THE PREPARATION OF BENZENESULPHONYL CHLORIDE

Heinz Ulrich Blank, Odenthal, Germany, assignor to Bayer Aktiengellschaft, Leverkusen, Germany

Filed Jul. 19, 1977, Ser. No. 817,464
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635281
Int. Cl.² C07C *143/26*
U.S. Cl. 260—543 R 18 Claims

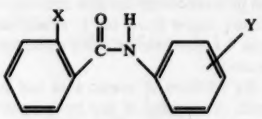
1. In a process for the preparation of benzenesulphonic acid chloride by contacting benzenesulphonic acid with thionyl chloride, the improvement which comprises carrying out the process in the presence of an electrophilic sulphonating agent.

4,105,693
PROCESS FOR PRODUCING 2-ALKYLBENZANILIDE

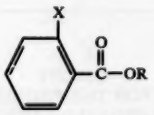
Isao Chiyomaru, Shimizu; Seigo Kawada, Fujieda, and Kiyoshi Takita, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 605,050, Aug. 15, 1975, Pat. No. 3,985,804, which is a division of Ser. No. 489,412, Jul. 11, 1974, Pat. No. 3,937,840. This application Apr. 22, 1976, Ser. No. 679,370
Claims priority, application Japan, Aug. 18, 1973, 48-92702
Int. Cl.² C07C *103/78*
U.S. Cl. 260—558 P 20 Claims

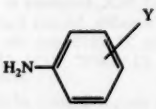
1. In a process for producing 2-alkylbenzanilide having the formula:



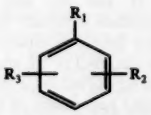
wherein X represents a C_{1-4} alkyl group and Y represents hydrogen, alkoxy, alkenyloxy, alkinyloxy, benzyloxy or halobenzyloxy, with the liberation of alcohol and N-alkylbenzanilide by-products, by reacting an alkyl 2-alkylbenzoate of the formula:



wherein R is a C_2–C_4 alkyl group and X is as defined above with an aniline compound of the formula:

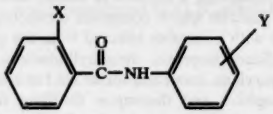


wherein Y is as defined above, the improvement comprising: reacting said benzoate with said aniline compound in an organic solvent of the formula:

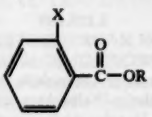


or R_4—O—R_5, wherein R_1 is lower alkyl or halogen; R_2 and R_3 are hydrogen, halogen or lower alkyl and R_4 and R_5 represent alkyl of more than 5 carbon atoms, in the presence of an alkali metal or alkaline earth metal alcoholate excluding methylate as an alcoholate, with the proviso that toluene is excluded from said organic solvent and with the proviso that when R is n-propyl, said solvent excludes o-, m-, and p-xylene and chlorobenzene; when R is n-butyl, said solvent excludes o-, m-, and p-xylene, ethylbenzene and chlorobenzene and when R is iso-butyl, said solvent excludes o-xylene, ethylbenzene and chlorobenzene, such that said reaction occurs without azeotropic separation of said solvent and the alcohol by-product released in said reaction and with the inhibition of the formation of said N-alkylbenzanilide.

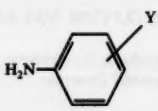
11. In a process for producing 2-alkylbenzanilide having the formula:



wherein X represents a C_{1-4} alkyl group and Y represents hydrogen, alkoxy, alkenyloxy, alkinyloxy, benzyloxy or halobenzyloxy, with the liberation of alcohol and N-alkylbenzanilide by-products, by reacting an alkyl 2-alkylbenzoate of the formula:

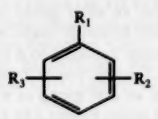


wherein R is a C_2–C_4 alkyl group and X is as defined above with an aniline compound of the formula:



wherein Y is as defined above, the improvement comprising:

(a) reacting said aniline compound in an organic solvent of the formula:



or R_4—O—R_5, wherein R_1 is lower alkyl or halogen; R_2 and R_3 are hydrogen, halogen or lower alkyl and R_4 and R_5 represent alkyl of more than 5 carbon atoms with an alkali metal or alkaline earth metal alcoholate excluding methylate as an alcoholate, with the proviso that toluene is excluded from the organic solvent and with the proviso that when R is n-propyl, said solvent excludes o-, m-, and p-xylene and chlorobenzene; when R is n-butyl, said solvent excludes o-, m-, and p-xylene, ethylbenzene and chlorobenzene and when R is iso-butyl, said solvent excludes o-xylene, ethylbenzene and chlorobenzene; and

(b) preparing said 2-alkylbenzanilide product by reacting said alkyl 2-alkylbenzoate with the reaction product of step (a) such that said reaction occurs without azeotropic separation of said solvent and the alcohol by-product released in said reaction and with the inhibition of the formation of said N-alkylbenzanilide.

4,105,694

PROCESS FOR MAKING TRIMETHYLAMINE ACRYLIMIDE

Avinash C. Mehta, Belmont; Donald O. Rickter, Arlington, and Lloyd D. Taylor, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 22, 1976, Ser. No. 753,521
Int. Cl.[2] C07B 29/00, 102/04
U.S. Cl. 260—561 H 2 Claims

1. The process which comprises the steps of condensing a mixture of 3-chloropropionyl chloride, 3-chloropropionic acid and trimethylhydrazinium p-toluenesulfonate, adjusting the pH to about 8 and converting the thus formed intermediate to trimethylamine acrylimide by thermal rearrangement and then a deprotonation step.

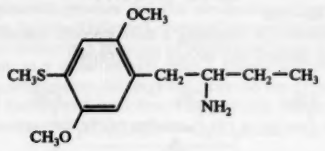
4,105,695

2-AMINO-1-(2,5-DIMETHOXYPHENYL)-BUTANES

Richard Anthony Partyka, Liverpool; Robert Ted Standridge, Cazenovia; Henry George Howell, East Syracuse, all of N.Y., and Alexander Theodore Shulgin, Lafayette, Calif., assignors to Bristol-Myers Company, New York, N.Y.

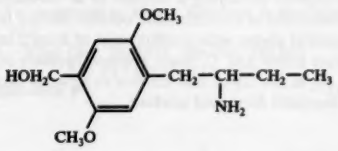
Continuation-in-part of Ser. No. 639,676, Dec. 11, 1975, abandoned. This application May 11, 1977, Ser. No. 795,699
Int. Cl.[2] C07C 87/28
U.S. Cl. 260—570.8 R 4 Claims

1. The compound of the formula



or a pharmaceutically acceptable nontoxic acid addition salt thereof.

2. The compound of the formula



or a pharmaceutically acceptable nontoxic acid addition salt thereof.

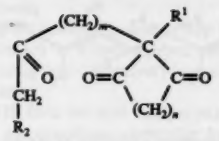
4,105,696

ASYMMETRIC SYNTHESIS OF ORGANIC COMPOUNDS

David Richard Parrish, Glen Ridge, and Zoltan George Hajos, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

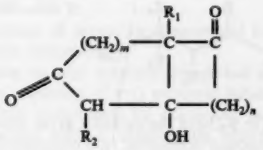
Continuation of Ser. No. 467,356, May 6, 1974, which is a division of Ser. No. 96,597, Dec. 9, 1970, Pat. No. 3,975,440, which is a continuation-in-part of Ser. No. 4,762, Jan. 21, 1970, abandoned. This application Sep. 7, 1976, Ser. No. 720,717
Int. Cl.[2] C07C 45/00, 49/36, 49/54, 49/82
U.S. Cl. 260—586 F 26 Claims

1. The process for the preparation of optically active compounds utilizing as the starting material as optically inactive compound of the formula



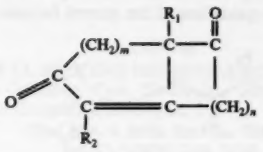
where R_1 is lower alkyl, aryl, aralkyl, lower alkenyl, lower alkynyl; R_2 is hydrogen, lower alkyl, aryl, aralkyl and $—(CH_2)_pR_3$ where p is an integer between 0 and 2 inclusive and R_3 is

where R_4 is hydrogen or lower alkyl and R_5 is lower alkylenedioxy or arylenedioxy; n is an integer between 1 and 5 inclusive and m is an integer between 1 and 4 inclusive which process comprises cyclizing said optically inactive compound in the presence of an optically active α- or β-aminoalcohol or α- or β aminoacid to produce an optically active compound as product of the formula



II

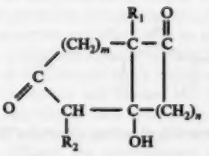
and



III

where R_1, R_2, *m* and *n* are as above having one more ring than said starting material.

22. Compounds of the formula



II

where R_1 is lower alkyl; R_2 is hydrogen or lower alkyl; *n* is an integer between 1 and 5 inclusive and *m* is an integer between 1 and 4 inclusive.

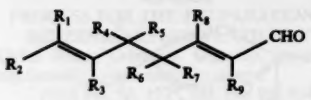
4,105,697

PROCESS FOR THE PREPARATION OF α, β-ETHYLENIC ALDEHYDES

Pierre Chabardes, Sainte-Foy les Lyon, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Jul. 6, 1976, Ser. No. 702,850
Claims priority, application France, Jul. 18, 1975, 75 22558
Int. Cl.[2] C07C 47/20, 45/00
U.S. Cl. 260—601 R 16 Claims

1. A process for the preparation of α,β-ethylenic aldehydes of the general formula:


(I)

in which

R_1, R_2 and R_4 represent a member of the group consisting of hydrogen, and:

(a) alkyl radicals containing from 1 to 25 carbon atoms; and

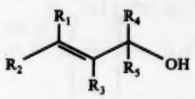
(b) alkenyl radicals containing from 2 to 30 carbon atoms; and

R_3 and R_5 are members of the group consisting of hydrogen and alkyl or alkenyl radicals having from 1 to 8 carbon atoms;

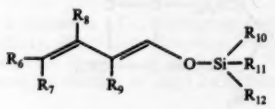
R_6 is a member of the group consisting of hydrogen and a lower alkyl radical;

R_7 is a member of the group consisting of hydrogen and an alkyl radical containing from 1 to 20 carbon atoms; an alkenyl radical containing from 2 to 20 carbon atoms, and

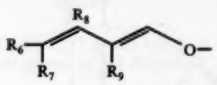
R_8 and R_9 are members of the class consisting of hydrogen and lower alkyl radicals, by reacting, at elevated temperatures of between about 50° and 350° C., an allyl alcohol of the general formula:


(II)

in which R_1 to R_5 have the meaning given above, with a dienoxy compound containing two conjugated ethylenic double bonds, wherein said dienoxy compound is a dienoxy triorganosilane of the general formula:


(III)

in which R_{10}, R_{11} and R_{12}, represent alkyl radicals containing from 1 to 10 carbon atoms, cycloalkyl radicals containing from 5 to 8 carbon atoms, two at most of R_{10}, R_{11} and R_{12} radicals representing a group of the formula:



and R_6 to R_9 have the meaning given for the formula (I).

4,105,698

PREPARATION OF CINNAMYL-SUBSTITUTED PHENOLS

Charles M. Starks, and Allan J. Lundeen, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Feb. 16, 1977, Ser. No. 769,080
Int. Cl.² C07C *39/17*
U.S. Cl. 568—744 **8 Claims**

1. A process for preparing orthosubstituted cinnamyl phenols wherein the process comprises heating an admixture of phenol and cinnamyl alcohol in the liquid phase and at a temperature in the range of about 125° to about 250° C. in the presence of an effective amount of activated alumina, which is α alumina monohydrate, catalyst.

4,105,699

PREPARATION OF O-BENZYLPHENOL

Charles M. Starks, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 16, 1977, Ser. No. 769,083
Int. Cl.² C07C *39/17*
U.S. Cl. 568—744 **9 Claims**

1. An improved process of preparing o-benzylphenol by the reaction of phenol and benzyl alcohol wherein the improved process comprises contacting an admixture of phenol and benzyl alcohol at a temperature in the range of about 125° to about 300° C. in the liquid phase in the presence of an effective amount of activated alumina, which is α-alumina monohydrate, catalyst.

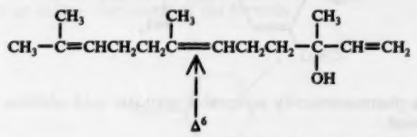
4,105,700

PROCESS FOR PREPARING STEREOSPECIFIC NEROLIDOL AND ESTER THEREOF

Yoshiji Fujita, Kurashiki; Yoshiaki Omura, Okayama; Takashi Nishida, and Kazuo Itoi, both of Kurashiki, all of Japan, assignors to Kuraray Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 605,455, Aug. 18, 1975, Pat. No. 4,028,385. This application Mar. 17, 1977, Ser. No. 778,730
Claims priority, application Japan, Mar. 12, 1976, 51-100631; Mar. 12, 1976, 51-100632; Mar. 23, 1976, 51-100633; Mar. 12, 1976, 51-100634; Mar. 19, 1976, 51-100635; Mar. 19, 1976, 51-104062; Apr. 26, 1976, 51-119797; Apr. 26, 1976, 51-119798
Int. Cl.² C07C *29/24*
U.S. Cl. 568—875 **20 Claims**

1. A process for obtaining a stereospecific nerolidol at the Δ^6 position thereof and having the formula:



which comprises rectifying a mixture of Δ^6-cis-nerolidol and Δ^6-trans-nerolidol in a rectification column having from 10 to 100 theoretical plates with a reflux ratio of from 2 to 200 at a temperature below 230° C. under reduced pressure of from 0.1 to 5 mm Hg at the top of said column to separate each stereospecific nerolidol from said mixture.

4,105,701

PURIFICATION OF MATERIALS CONTAINING CARBONYL CONTAMINANTS

Donald R. Larkin, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,238
Int. Cl.² C07C *17/38, 67/48, 29/24*
U.S. Cl. 260—650 R **5 Claims**

1. A method for removing an aldehyde contaminant from a liquid member of the group consisting of monochlorobenzene; the propanediols; the butanediols; vinyl acetate; glycerine; bis-(hydroxyethyl) terephthalate; and mixtures of bis-(hydroxyethyl) terephthalate with an inert solvent, which method comprises passing said liquid through a liquid-permeable bed of solids consisting essentially of polyvinyl alcohol and adsorbing said aldehyde upon said solids at a temperature which is between that at which said polyvinyl alcohol begins to soften and that at which said liquid solidifies.

4,105,702

METHOD FOR PREPARING HALOGENATED ALKANES AND ALKENES

Charles R. Mullin, Sault St. Marie, Mich., and Donald J. Peretti, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 309,418, Nov. 24, 1972, abandoned, which is a division of Ser. No. 807,116, Mar. 13, 1969, Pat. No. 3,726,932. This application Feb. 23, 1977, Ser. No. 769,483

Int. Cl.[2] C07C *17/00*

U.S. Cl. 260—658 R 3 Claims

1. A method for preparing halogenated alkanes and alkenes which comprises reacting, by contacting in the absence of or in the presence of an inert diluent N for 0.005 to 0.1 second at a temperature of from about 675° C to 850° C, a halogenating agent of the formula CCl_xBr_{4-x}, wherein x is an integer from 0 to 4, with a compound of the formula R_2CH_2, wherein one R is H, Cl or Br and the other R is Cl or Br; and wherein the mole ratio of R_2CH_2+N/CCl_xBr_{4-x} is from at least 2/1 to 100/1 when N is absent and from 10/1 to 100/1 when N is present.

4,105,703

CONTINUOUS PROCESS FOR THE PRODUCTION OF CYCLOHEXYL MAGNESIUM HALIDES

Raimondo Motta, Pero (Milan), Italy, assignor to Oxon Italia S.p.A., Milan, Italy

Continuation of Ser. No. 692,506, Jun. 3, 1976, abandoned. This application Jul. 28, 1977, Ser. No. 819,988

Claims priority, application Italy, Jun. 6, 1975, 24100 A/75

Int. Cl.[2] C07F *3/02*

U.S. Cl. 260—665 G 5 Claims

1. Continuous process for the production of cyclohexyl magnesium halide (Grignard reagent) characterized in that, cyclohexyl halide in a solution of tetrahydrofuran is fed from the bottom, at a constant rate, into a thermostatized column containing magnesium shavings fed from the top of the column itself, and the desired cyclohexyl magnesium halide is recovered in the top part of the column.

4,105,704

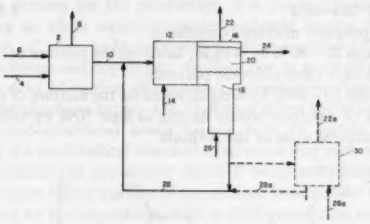
METHOD FOR PREPARING AND USING A SOLUBLE METAL PENTAFLUORIDE-HYDROGEN FLUORIDE CATALYST

Geoffrey R. Say, and William C. Baird, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 29, 1976, Ser. No. 758,054

Int. Cl.[2] C07C *3/52, 5/24*

U.S. Cl. 260—666 P 15 Claims



1. A process for preparing and using a homogeneous liquid phase catalyst containing a metal pentafluoride selected from the group consisting of tantalum pentafluoride, niobium pentafluoride and mixtures thereof and hydrogen fluoride, the mole ratio of HF to metal pentafluoride being between 5 and 40, which comprises the steps of

(1) contacting tantalum metal, niobium metal or mixtures thereof with substantially anhydrous liquid HF at a temperature ranging from 0° to 105° C for a time sufficient to form a homogeneous liquid phase catalyst having a mole ratio of HF to metal pentafluoride between about 100/1 to 50/1, said contacting being effected in the absence of an organic solvent,

(2) contacting the catalyst formed in step (1) with a hydrocarbon feedstock in a hydrocarbon conversion process, thereby forming an acid catalyst phase and a hydrocarbon product phase,

(3) stripping HF from the acid catalyst phase formed in step (2) with a gas containing molecular hydrogen, thereby forming a homogeneous liquid phase acid catalyst having a mole ratio of HF to metal pentafluoride less than that of the acid catalyst formed in step (1), and

(4) passing the acid catalyst formed in step (3) to the hydrocarbon conversion process of step (2) until a homogeneous liquid phase catalyst having a mole ratio of HF to metal pentafluoride between 5 and 40 is obtained.

4,105,705

SYMMETRICAL BIARYL SYNTHESIS VIA RHODIUM CATALYZED DIMERIZATION OF ARYL MERCURIC SALTS

Richard Craig Larock, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation-in-part of Ser. No. 681,783, Apr. 30, 1976, Pat. No. 4,026,957. This application Dec. 27, 1976, Ser. No. 754,116

Int. Cl.[2] C07C *15/00*

U.S. Cl. 260—668 R 16 Claims

1. A method of preparing symmetrical biaryl compounds, said method comprising,

dimerizing an aryl mercuric compound selected from the group consisting of aryl mercuric halide salts and diaryl mercuric compounds by contacting said aryl mercuric compound with a catalytically effective dimerization inducing amount of a rhodium catalyst.

4,105,706

C_8 ALKYL BENZENE ISOMERIZATION PROCESS

James P. Gallagher, Park Forest, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Nov. 8, 1976, Ser. No. 739,894

Int. Cl.[2] C07C *5/24, 5/30*

US. Cl. 260—668 A 10 Claims

1. In a process for isomerizing C_8 alkyl benzene isomers which includes (1) contacting a hydrocarbon feedstock containing at least one C_8 alkyl benzene isomer in at least one reaction zone in the presence of added free molecular hydrogen with solid particles comprising about 25% to about 99% by weight of a carrier and about 1% to about 75% by weight of at least one crystalline aluminosilicate capable of promoting isomerization of said isomer at C_8 alkyl benzene isomerization conditions to isomerize said isomer and to form deactivating carbonaceous deposits on said solid particles; and (2) recovering a mixture of at least two C_8 alkyl benzene isomers from the reaction zone effluent, the improvement which comprises:

increasing the amount of hydrogen added to said reaction zone as said contacting progresses to maintain or increase the hydrogen to hydrocarbon molar ratio entering said reaction zone thereby providing for improved catalytic isomerization activity of said solid particles.

4,105,707

COMBINATION ALKYLATION-REFORMING PROCESS

Donald M. Little, and Paul D. Hann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 8, 1976, Ser. No. 739,904

Int. Cl.[2] C07C *3/54*

U.S. Cl. 260—683.48 10 Claims

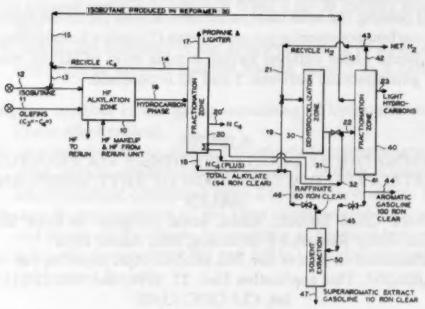
1. A process for the production of high octane motor fuel which comprises:

(a) alkylating in an alkylation zone isobutane and at least one olefin in the presence of an alkylation acid catalyst;

(b) separating the alkylation effluent into a catalyst phase and a hydrocarbon phase;

(c) fractionating said hydrocarbon phase obtained in (b) into a fraction comprising isobutane, a fraction comprising propane and lighter materials, and a total alkylate fraction which includes at least a portion of the normal butane present in said alkylation effluent;

(d) passing all of said total alkylate fraction in (c) to a reforming zone and therein subjecting same to dehydrocyclization and isomerization reforming conditions of temperature and pressure in the presence of hydrogen and a suitable reforming catalyst to isomerize normal butane to isobutane and to dehydrocyclize isoparaffins to aromatics and thereby increase the aromatic content of said alkylate; and



(e) recovering from step (d) isobutane and an alkylate product of improved gasoline characteristics having an increased aromatic content and an octane number (RON clear) of about 100.

4,105,708

DIMETHOXYMETHYL DIETHOXYMETHYL GLYCOLURIL AND COATING COMPOSITIONS CONTAINING THE SAME AS A CROSS-LINKING AGENT

Girish Girdhar Parekh, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 7, 1976, Ser. No. 721,008
Int. Cl.² C08G 12/28; C08L 61/26
U.S. Cl. 260—849 **3 Claims**

2. A composition of matter comprising a blend of from about 2% to about 50% by weight of a normally liquid, substantially fully mixed-alkylated, substantially fully methylolated glycoluril derivative which is essentially dimethoxymethyl diethoxymethyl glycoluril and correspondingly between about 98% and 50%, by weight of a non-gelled, polymeric material carrying an anionic charge, said polymeric material containing at least one class of reactive groups selected from the group consisting of carboxyl groups, alcoholic hydroxyl groups and amide groups, the amount of said groups in said polymeric material being at least about 0.5%, by weight, and not more than about 20%, by weight, based on the total weight of said polymeric material; said groups being reactive with said glycoluril derivative and said percentages of said glycoluril derivative and said polymeric material being based on the total weight of said glycoluril derivative and said polymeric material, said composition also containing from about 0.5% to about 5.0%, by weight, based on the total weight of said glycoluril derivative and said polymeric material, of an acid catalyst.

4,105,709

POLYAMIDE COMPOSITIONS

Isamu Iwami; Hironobu Kawasaki, and Atsuro Kodama, all of Kawasaki, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Mar. 30, 1976, Ser. No. 671,743
Claims priority, application Japan, Apr. 3, 1975, 75-39755
Int. Cl.² C08L 77/00
U.S. Cl. 260—857 L **15 Claims**

1. A composition comprising (A) 50 to 95 parts by weight of a polyamide and (B) 50 to 5 parts by weight of an ethylenic copolymer of ethylene, (a) an alkyl ester of unsaturated carboxylic acid, (b) an unsaturated carboxylic acid, an (c) a metal salt of unsaturated carboxylic acid, the proportion of ethylene in the copolymer being from 90% to 98% by mole and the monomeric units (a), (b) and (c) having the following relationship in terms of the number of moles *a*, *b*, and *c*, respectively:

$a/(a + b + c) \times 100 = 5 - 50\%$ and

$c/(a + b + c) \times 100 = 5 - 90\%$.

4,105,710

FLAME-RETARDANT COPOLYMERS

James L. Thomas, Hamilton Square, and Gert P. Volpp, Princeton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Nov. 12, 1975, Ser. No. 631,239
Int. Cl.² C08L 67/06
U.S. Cl. 260—869 **4 Claims**

1. A flame-retardant thermosetting vinyl-unsaturated composition comprising a thermosetting vinyl-unsaturated polymer capable of further polymerization to the thermoset stage of the group consisting of unsaturated polyester and diallyl phthalate prepolymers containing as a flame-retarding agent from 5 to 50%, by weight of total polymerizable material, of diallyl tetrabromophthalate, the composition being distinguished not only by its flame resistance but by good high temperature performance.

4,105,711

PVC MOULDING COMPOUNDS WITH HIGH DIMENSIONAL STABILITY TO HEAT

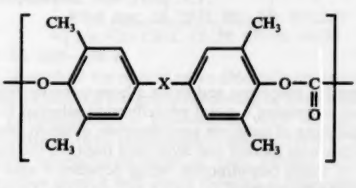
Dietrich Hardt, Cologne; Volker Serini; Hugo Vernaleken, both of Krefeld, and Hans-Eberhard Braese, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 540,982, Jan. 14, 1975, abandoned. This application Oct. 28, 1975, Ser. No. 626,354
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1974, 2402176
Int. Cl.² C08L 69/00, 27/06, 7/00, 9/00
U.S. Cl. 260—873 **9 Claims**

1. A polymer mixture comprising:

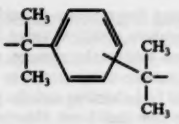
(a) from 20 - 90% by weight, based on the mixture of (a) and (b), of a vinyl chloride polymer;

(b) from 10 - 80% by weight, based on the mixture of (a) and (b), of a polycarbonate having at least 50% by weight of structural units of the formula



(1)

wherein X is a single bond, —O—, —CO—, —SO_2—, C_1–C_{10} alkylene, C_1–C_{10} alkylidene, C_5–C_{10} cycloalkylene, C_5–C_{15} cycloalkylidene, C_5–C_{20} cycloalkyl-alkylidene or the group



4,105,712

FLAME-RESISTANT POLYCARBONATE MOLDING COMPOSITIONS

Dieter Margotte, Krefeld-Bockum, and Hugo Vernaleken, Krefeld, both of Germany, assignors to Bayer Aktiengellschaft, Leverkusen, Germany

Division of Ser. No. 458,620, Apr. 8, 1974, Pat. No. 3,946,090. This application Nov. 24, 1975, Ser. No. 634,983

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1973, 2321055

Int. Cl.[2] C08L *67/06*

U.S. Cl. 260—873 4 Claims

1. A molding composition having an oxygen index of greater than 0.30 according to ASTM D-2863/70 consisting essentially of an aromatic polycarbonate containing 1–5% by weight of a polyacrylonitrile fiber which is stable in a melt of polycarbonate.

4,105,713

POLYMERS AND COPOLYMERS OF INDENE

Pierre Sigwalt, St. Michel-sur-Orge; Alain Polton, Paris; Cecile Baudin, Kremlin Bicetre, and Mihajlo (Michel) Miskovic, Paris, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Nov. 14, 1975, Ser. No. 631,991

Claims priority, application France, Nov. 18, 1974, 74 37856

Int. Cl.[2] C08F *279/02, 259/02*

U.S. Cl. 260—879 17 Claims

1. Elastomers with thermoplastic properties consisting of a chlorobutyl rubber elastomeric chain having graft polymerized thereon a mixture of indene and a styrene derivative selected from the group consisting of α-methyl styrene and para-alkylstyrene.

4,105,714

COUPLING OF ALKALI METAL-TERMINATED POLYMERS

William J. Trepka, and Alvin C. Rothlisberger, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 19, 1976, Ser. No. 678,095

Int. Cl.[2] C08F *8/18, 8/30, 8/04*

U.S. Cl. 260—879 18 Claims

6. A process for the production of a polymer comprising reacting an alkali metal-terminated polymer having the formula M—Z wherein M represents an alkali metal and Z represents polymer and copolymer chains of one or more alkadienes having 4 to 12 carbon atoms and/or copolymer chains of at least one alkadiene having 4 to 12 carbon atoms and at least one monovinyl-substituted arene having 8 to 18 carbon atoms having the vinyl radical attached to an arene ring carbon atom, said polymer and copolymer chains Z being unhydrogenated or having at least a portion of the olefinic unsaturation thereof removed by hydrogenation, with a trihalo-s-triazine coupling agent having the formula

wherein X is selected from the group of halogens consisting of chlorine, bromine, and iodine.

4,105,715

CYANOACRYLATE ADHESIVE PASTE COMPOSITIONS

Edward Roger Gleave, Dublin, Ireland, assignor to Loctite (Ireland) Limited, Dublin, Ireland

Filed Jul. 11, 1977, Ser. No. 814,581

Claims priority, application Ireland, Jul. 14, 1976, 1553/76

Int. Cl.[2] C08L *33/00*

U.S. Cl. 260—881 5 Claims

1. A thixotropic, curable adhesive composition comprising:

(a) a monomeric ester of 2-cyanoacrylic acid,

(b) for each 100 parts by weight of monomeric ester, about 5 to about 100 parts by weight of a polyvinylidene fluoride powder.

4,105,716

PROCESS FOR PRODUCING TETRAFLUOROETHYLENE/HEXAFLUOROPROPYLENE COPOLYMER BLENDS

Shoji Sakai, Settsu, and Masahiro Okuda, Amagasaki, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Feb. 11, 1977, Ser. No. 767,967

Claims priority, application Japan, Feb. 17, 1976, 51-16639

Int. Cl.[2] C08F *214/26*

U.S. Cl. 260—884 6 Claims

1. A process for producing a tetrafluoroethylene/hexafluoropropylene copolymer having a hexafluoropropylene content of 8 to 20% by weight by polymerizing tetrafluoroethylene and hexafluoropropylene in the presence of a polymerization initiator, which comprises polymerizing the monomers with an amount of hexafluoropropylene monomer of about 54 to 88% by weight and the balance of polymerizable monomer being tetrafluoroethylene in the polymerization system under conditions whereby the hexafluoropropylene content of the copolymer produced in the later stage is in the range of 10 to 20% by weight and is at least 2% higher than it was at the end of the first stage.

4,105,717

NAILABLE VINYL CHLORIDE-BASED INJECTION-MOLDING COMPOUND

David J. Burkey, Millersville, and Clifford M. Rosenau, Willow Street, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed May 18, 1976, Ser. No. 687,494

Int. Cl.[2] C08L *9/06, 23/04, 47/00*

U.S. Cl. 260—889 16 Claims

1. A polyvinyl chloride composition comprising

(a) as the major component a vinyl chloride polymer component selected from the group consisting of a copolymer comprising vinyl chloride as a predominant comonomer and a minor amount of propylene as a comonomer, and vinyl chloride homopolymer,

(b) as a minor component, chlorinated polyethylene,

(c) as a minor component a predominantly styrene copolymer of styrene and acrylonitrile, and

(d) as a minor component a styrene-butadiene copolymer thermoplastic elastomer,

said composition being characterized by resistance to splitting as the result of being nailed when such compositions are formed into molded articles by injection-molding processes.

4,105,718
PEROXIDE TREATED SUBSTANTIALLY AMORPHOUS POLYOLEFIN/HYDROCARBON RUBBER BLENDS USEFUL AS PRESSURE-SENSITIVE ADHESIVES

Doyle A. Weemes, Greeneville, and Richard L. McConnell, Kingsport, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

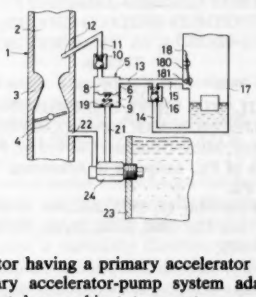
Filed Jul. 6, 1977, Ser. No. 813,376
Int. Cl.[2] C08F 8/06
U.S. Cl. 260—889 12 Claims

1. A process for preparing tacky modified amorphous polyolefin/hydrocarbon rubber compositions useful as pressure sensitive adhesives which comprises reacting a blend comprising at least one hydrocarbon rubber selected from the group consisting of ethylene/propylene copolymer rubber, ethylene/propylene/diene terpolymer or blends of such hydrocarbon rubbers and up to 50 weight percent of at least one substantially amorphous polyolefin selected from the group consisting of substantially amorphous homopolymers of 1-olefins containing 3 to 5 carbon atoms, substantially amorphous copolymers prepared from either ethylene and 1-olefins containing 3 to 5 carbon atoms or propylene and 1-butene, and substantially amorphous propylene or 1-butene/higher 1-olefin copolymers containing less than 40 mole percent of at least one higher 1-olefin of the group consisting essentially of 1-hexene, 1-heptene, 1-octene, 1-nonene, and 1-decene having a melt viscosity of about 100 to 200,000 cp. at 190° C. with about 2 to 25 weight percent of at least one peroxide selected from the group consisting of ditertiarybutyl peroxide, 2,5-dimethyl-2,5-di(tertiarybutylperoxy)hexane, dicumyl peroxide, and cumene hydroperoxide at a temperature of 150° C. to 250° C. to provide a low viscosity, permanently tacky hot-melt pressure sensitive adhesive.

4,105,719
CARBURETOR WITH AUXILIARY ACCELERATOR-PUMP SYSTEM

Haruhiko Saito, Nagoya, and Michio Morishita, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 15, 1977, Ser. No. 777,577
Claims priority, application Japan, Nov. 12, 1976, 51-135205
Int. Cl.[2] F02M 7/08
U.S. Cl. 261—34 B 11 Claims



1. A carburetor having a primary accelerator pump and a separate auxiliary accelerator-pump system adapted to be operated only at low ambient temperatures, said auxiliary accelerator-pump comprising:

an intake passage including a venturi portion and a throttle valve;

a fuel reservoir or bowl;

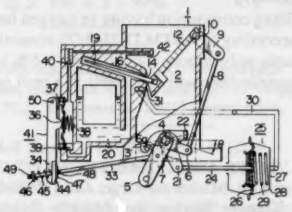
an auxiliary acceleration pump including a fuel chamber and a vacuum chamber which are separated by a spring-loaded diaphragm, said fuel chamber being communicated by way of a first check valve to a pump jet opening into said intake passage upstream of said venturi portion and by way of a second check valve to said fuel reservoir, said fuel chamber being further communicated with a portion of said fuel reservoir above the fuel level therein; and said vacuum chamber being communicated with a portion of said intake passage downstream of said throttle valve by way of a temperature sensitive valve between said vacuum chamber and said intake passage; and

a temperature responsive valve means to open communication between said fuel chamber and the portion of said fuel reservoir above the fuel level therein, only when the ambient temperature exceeds a given level.

4,105,720
VARIABLE STAGE TYPE CARBURETOR

Yukio Hohsho; Kimiji Karino; Masakichi Momono; Yoshishige Oyama; Teruo Yamauchi, all of Katsuta, and Takao Teranishi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 713,989, Aug. 12, 1976, abandoned.
This application Aug. 29, 1977, Ser. No. 828,670
Claims priority, application Japan, Aug. 15, 1975, 50-98631
Int. Cl.[2] F02M 9/08
U.S. Cl. 261—34 A 3 Claims



1. In a variable stage type carburetor including: an intake passage; a throttle valve positioned in said intake passage; a movable venturi vane positioned upstream of said throttle valve in said intake passage, said venturi vane being cooperative with the inner wall of said intake passage for providing a variable venturi; and means for operatively connecting said venturi vane to said throttle valve by the medium of a resilient member, whereby said venturi vane may be angularly displaced commensurate to an opening of said throttle valve; the improvements comprising:

a vane controller for forcedly decreasing an opening of said movable vane, when a venturi negative pressure is lowered in response to a negative pressure in said venturi portion at such an opening of said throttle valve, which is greater than a given opening;

a fuel supply pump for additionally supplying fuel into said intake passage;

a connecting means for operably connecting said throttle valve to said fuel supply pump so as to operate said fuel supply pump in response to an opening action of said throttle valve, said connecting means being so designed that said pump may be operated throughout the entire stroke thereof, during the time in which said throttle valve is opened from its closed position to said given opening.

4,105,721
VENTURI FITTING FOR THE AERATION OF WATER

Rae D. Schliebe, 34 Diamond Dr., Livermore, Calif. 94550

Filed Jun. 16, 1975, Ser. No. 586,952
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—76 5 Claims

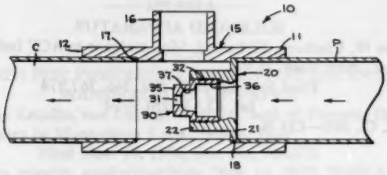
1. A fitting for aerating water comprising:

(a) means for conducting water from a source;

(b) a conduit through which water flow communicating with said means for the passage of water thereinto, said conduit being formed with an air inlet for introducing air under pressure into said conduit for aerating the water flowing therethrough;

(c) an adapter disposed in said conduit in fixed relation thereto and forming a passage in said conduit through which water flowing in said conduit is conducted; and

(d) an insert removably secured to said adapter and disposed within said conduit, said insert being formed with a discharge orifice, said insert being arranged to provide a passage for the flow of water advancing through said adapter for discharge through said discharge orifice within said conduit, the diameter of the passage provided by said insert for the flow of water advancing through said adapter being lesser than the diameter of the passage formed by said adapter through which water is conducted, said insert being formed with a nut-like projection



directed in the direction of flow of said water through said conduit,

(e) said adapter including an outer wall fixed to an inner wall of said conduit in water-tight relation and an internally threaded cylindrical wall, said insert being formed with an externally threaded cylindrical wall for threaded engagement with said internally threaded wall of said adapter, said nut-like projection of said insert projecting from said threaded wall of said insert, said discharge orifice being formed in said nut-like projection.

4,105,722

LIGHTWEIGHT, CLOSED-CELL FOAM ELASTOMERIC ELEMENTS FOR USE IN COUNTERCURRENT GAS-LIQUID CONTACT OPERATIONS

Paul H. Sorenson, Fairfield, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation of Ser. No. 562,603, Mar. 27, 1975, abandoned. This application Jul. 15, 1977, Ser. No. 816,065

Int. Cl.² B01F *3/04*

U.S. Cl. 261—94 **5 Claims**

1. A method of contacting gas and liquid streams in a floating bed scrubber comprising countercurrently contacting said gas and liquid streams in the presence of an aerated mass of lightweight, mobile elements of spheroidal form, said mobile elements comprising closed-cell elastomeric foam formed from the molding and post curing of a blend consisting essentially of a nitrile polymer and polyvinyl chloride utilized in conjunction with a blowing agent, said closed-cell foam extending throughout the entire cross-section of said spheroidal elements, said mobile elements, after said post curing, having a relatively smooth, self-skinned surface, said mobile elements being of a resilience to preclude breakage thereof and of a softness and flexibility to effect self-cleaning characteristics, said mobile elements permitting uniform wear without breakage or liquid absorption during said contacting of said gas and liquid streams.

4,105,723

VAPOR-LIQUID CONTACTING

Thomas W. Mix, Wellesley, Mass., assignor to Merix Corporation, Wellesley, Mass.

Filed May 24, 1976, Ser. No. 689,178

Int. Cl.² B01J *10/00*; B01D *3/22*

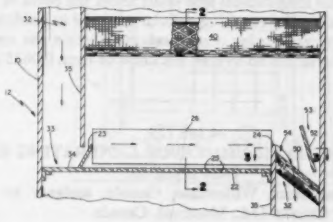
U.S. Cl. 261—105 **67 Claims**

1. In a vapor-liquid contacting process comprising supplying vapor through an orificed tray in a contacting and separating stage of the cross-flow type having vapor and liquid inlets thereto, wherein said tray is mounted in effective communication with both said inlets to permit vapor to rise through said tray to contact said liquid thereabove and produce a two phase dispersion of vapor and liquid supported on said tray, and wherein the maximum permissible throughput of vapor through said stage is limited by a flooding point associated with said stage, that improvement comprising

raising said flooding point by providing a multiplicity of spaced, generally vertical baffles above said tray, said baffles extending generally in the direction of liquid flow across said tray and being sufficiently close together to substantially reduce the amplitude of vertical oscillations in said dispersion having a wavelength which is small relative to the width of said tray, said tray being orificed between each pair of said baffles, and

increasing the superficial vapor velocity through said stage to a value corresponding to vapor throughput exceeding said maximum permissible throughput associated with said stage in the absence of said baffles.

15. In a vapor-liquid contacting apparatus of the cross-flow type having a column housing and at least one contact stage in said housing, said apparatus including liquid and vapor inlets to



said stage and an orificed tray mounted in effective communication with both said inlets to permit vapor to rise through said tray to contact said liquid thereabove and produce a two phase dispersion of vapor and liquid supported on said tray, and wherein the minimum permissible effective height of said stage is limited by a flooding point associated with said stage, that improvement wherein

a multiplicity of spaced, generally vertical baffles are arranged above said tray, said baffles extending generally in the direction of liquid flow across said tray and being sufficiently close together to raise said flooding point by substantially reducing the amplitude of vertical oscillations in said dispersion having a wavelength which is small relative to the width of said tray, and

the effective height of said stage is less than said minimum permissible height associated with said stage in the absence of said baffles

wherein said baffles are corrugated to provide liquid flow channels sloping downwardly and in the direction of liquid flow across the tray.

4,105,724

CONTACT PACKING

Edward Butterfield Talbot, London, England, assignor to Ruckluft Patent AG., Lucern, Switzerland

Filed Oct. 8, 1975, Ser. No. 620,714

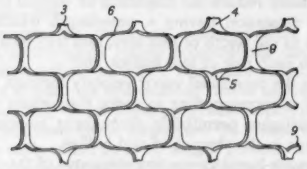
Claims priority, application United Kingdom, Nov. 13, 1974, 49181/74

Int. Cl.² B01D *39/16, 47/00*; B29C *17/02*

U.S. Cl. 261—112 **3 Claims**

1. A cellular contact packing material produced from a planar sheet of material which has an initial thickness within the range of 0.003 inch to 0.2 inch and is capable of setting in a desired configuration by a process which comprises cutting in the said sheet separate linear slits, each having an equal length of from 0.25 inch to 6.0 inches, in a series of substantially parallel linear rows to form an array wherein each of the slits in a given row is out of phase with each of the slits in the adjacent row in a regular pattern as illustrated in FIG. 1 of the

drawings, subsequently subjecting the sheet to tension in a direction perpendicular to the linear rows of slits, maintaining the tension until the slits have opened up to form a three-dimensional integral array comprising a plurality of cells of substantially rectangular configuration when viewed in plan wherein each of the opposite side walls of each cell in a longitudinal direction has an intermediate point of inflexion and



each of the opposite side walls of each cell in a transverse direction has a thickness equal to the sum of thickness of each portion of the longitudinal side walls about the point of inflexion, and causing the resulting cellular material to harden in the substantially rectangular configuration, wherein the resulting cellular material has an overall thickness of from 0.0625 inch to 2.0 inches.

4,105,725

SATURATED LIQUID/VAPOR GENERATING AND DISPENSING

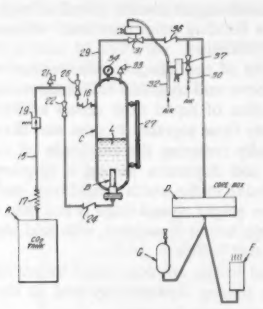
Edward Alan Ross, Willowdale, Canada, assignor to Liquid Carbonic Canada Ltd., Montreal, Canada

Filed Aug. 27, 1973, Ser. No. 392,080

Claims priority, application United Kingdom, Nov. 21, 1972, 53767/72; Canada, Jun. 29, 1973, 175275

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—122 **22 Claims**



1. A process for generating in a pressure vessel a ready supply of a saturated vapor of a normally liquid active substance in an inert carrier gas under pressure and dispensing vapor intermittently from the supply, comprising,

providing in the vessel a body of said active liquid substance and an overlying atmosphere of vapor in a space above said liquid,

dispensing the vapor from the vapor space in a continuous series of intermittent bursts each producing a pressure drop within the vessel intervened by a short non-dispensing period,

responsive immediately to the pressure drop caused by each burst introducing carrier gas under pressure into a bottom zone of the vessel during each non-dispensing period until equilibrium pressure is restored therein and the vapor lost in said burst is replaced by the introduction of additional gas,

finely dividing said carrier gas as it is introduced to form in said liquid a mass of minute bubbles effective to provide intimate contact between gas and liquid whereby a saturated vapor is formed to the exclusion of entrained liquid and conveyed to the vapor space during each non-dispensing period,

maintaining a relationship between the depth of the vapor space, the head of liquid above the introduction zone, the relative volume of each burst to that of the vapor space, and the initial size of the bubbles so as to ensure the presence in the vapor space of a true saturated vapor substantially free of entrained liquid.

4,105,726

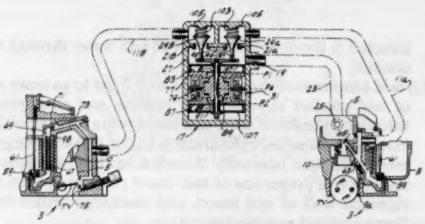
SOLENOID APPARATUS

Allen W. Lindberg, Kirkwood, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Feb. 11, 1977, Ser. No. 767,874

Int. Cl.[2] F02M *7/24*

U.S. Cl. 261—121 B **2 Claims**



1. Solenoid Apparatus for metering the quantity of air supplied to a fuel system in a carburetor for an internal combustion engine, said carburetor having at least one air passageway therein through which air is drawn into eingine, fuel from a source thereof being supplied to said carburetor through said fuel system and mixed with air as it passes through the carburetor and the carburetor having a conduit through which air is introduced into said fuel system, the apparatus comprising:

a chamber having an air inlet in communication with the air passageway of the carburetor and an air outlet in communication with the conduit;

first and second electrical windings to which current is supplied, current flow through each of said windings inducing respective magnetic fields the strengths of which are functions of the average current flow therethrough and the magnetic fields combining to produce a net magnetic field;

an armature movable in either of two directions between a first position and a second position;

means biasing the armature toward a position intermediate the first and second positions constituting a reference position, the position of the armature at any one time being determined by the net magnetic field and a force on the armature produced by the biasing means, said biasing means comprising first and second springs acting on respective ends of the armature to bias the armature in one direction away from said first position and in the opposite direction away from said second position, the forces exerted by said springs being balanced by the net magnetic field when the armature is at said reference position, and said armature having a shaft extending axially through the springs and movable therewith, each spring being a scroll spring comprised of a disk of resilient material having a central opening therethrough in which an end of said shaft is disposed and a plurality of slots cut in a predetermined pattern such that each spring is flexible in either direction of armature movement for linear movement of the armature from one position to another;

metering means disposed in said air outlet and movable with the armature as it moves between said first and second

positions to more fully open or close the air outlet depending upon the direction of armature movement;

means for supplying current to said windings; and

control means to which the current supply means is responsive for varying the average current flow in each winding, each variation in the average current flow produced by the control means resulting in movement of the armature and changing of the position of the metering means relative to the air outlet thereby to change the quantity of air supplied to the fuel system through the conduit.

4,105,727

PROCESS FOR PREPARING FIBRILS FOR USE IN THE MANUFACTURE OF PAPER

Giuseppe Zanella, and Luciano Mancini, both of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Nov. 10, 1976, Ser. No. 740,678

Claims priority, application Italy, Nov. 11, 1975, 29189 A/75

Int. Cl.² B02C *18/00*; C08F *6/00*

U.S. Cl. 264—12 **3 Claims**

1. A process for preparing polypropylene fibers which are directly usable, without cutting or reducing operations, as substitutes, in whole or in part, for cellulose fibers in the manufacture of paper and paper-like articles, said process consisting in extruding through an orifice a solution or dispersion of polypropylene in n-hexane under conditions such that the solvent is evaporated practically immediately in the extrusion environment, and in conveying against the extruded solution or dispersion a gaseous fluid jet having a high velocity and an angular direction with respect to the direction of extrusion of the polypropylene solution or dispersion, and being characterized in that the polypropylene solution or dispersion extruded contains from 2 to 25 moles of monomeric propylene per 100 moles of hexane-propylene solution and in that the solution or dispersion is extruded at a temperature comprised between 180° C and 235° C.

4,105,728

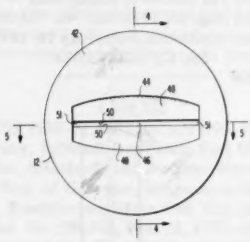
SPINNING METHOD AND APPARATUS

Wei-Kuo Lee, Millburn, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 22, 1976, Ser. No. 725,212

Int. Cl.² B28B *21/54*

U.S. Cl. 264—40.7 **42 Claims**



1. In a method of forming tape from fiber-forming liquid polymeric material wherein the material is passed through an elongate exit slit of a die and drawn to a solidification zone, the improvement comprising establishing a condition of flow of liquid material through the slit to enforce a ratio of the extensional strain rate to the shear strain of the liquid material leaving the slit of not less, at any location along the slit length, than that ratio adjacent the center of the slit.

4,105,729

METHOD OF MAKING SHAPED BODIES

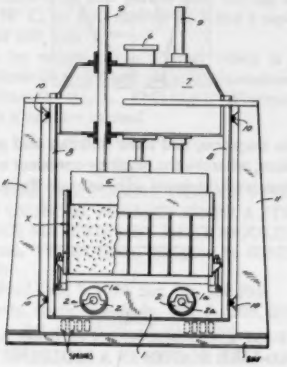
Gunter Helmrich, Grevenbroich, and Fritz Wülfing, Rheydt, both of Fed. Rep. of Germany, assignors to Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn, Fed. Rep. of Germany

Division of Ser. No. 854,184, Aug. 29, 1969, abandoned. This application Jul. 29, 1971, Ser. No. 167,126

The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.

Int. Cl.² B28B *1/04*; B29G *1/00*

U.S. Cl. 264—71 **1 Claim**



1. In a method of producing coherent bodies from coherable granular material, the steps comprising: providing a vibratory compacting device including a mold mounted for vibratory movement; confining a mass of granular material in said mold; resting a cover weight freely on top of said granular material; vibrating said mold at a first frequency while said cover weight rests freely on said granular material until partial compacting of said granular material is effected, said first frequency being accommodated to the resonance characteristics of said granular material; thereafter applying a substantial force to said cover weight to brace it against said partially compacted granular material; and vibrating said mold at a second frequency substantially higher than said first frequency while said cover plate is braced against said granular material, said second higher frequency being at least a multiple of said first frequency and being a function of the resonance characteristics of the vibrating system with said cover weight braced against said granular mass.

4,105,730

METHOD OF MAKING A FLEXIBLE, COLLAPSIBLE CONTAINER FOR LIQUIDS WITH IMPROVED TAIL SEAL

Frank Cammarata, III, Wheeling; Joe Alan Miller, Lake Zurich, both of Ill., and Jerry D. Martin, Kenosha, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

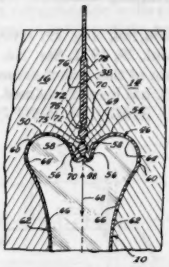
Filed Jan. 12, 1976, Ser. No. 648,603

Int. Cl.² B29C *17/07*

U.S. Cl. 264—89 **10 Claims**

1. The method of sealing the end of a heat-softened plastic tubular parison in a mold which results in a finished container having a wall thickness of no more than 0.05 inch adjacent the area to be sealed, which comprises closing said mold about said parison, collapsing the end of said tubular parison together across its entire width, whereby opposite sides of said parison combine to form a flat plastic piece; pressing a segment of said flat plastic piece with force sufficient to cause said plastic to flow; and causing said flowing plastic to move in opposite axial directions relative to the heat-softened plastic parison to form a pair of spaced rod members positioned in said plastic piece

transversely to said axial directions and exending across the entire width of the resulting container, and to correspondingly cause the flat plastic piece between said rod members to be



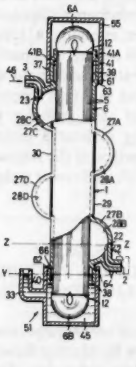
reduced in thickness, and blow molding said parison to form the container, whereby the resulting container exhibits a generally uniform wall thickness adjacent said flat plastic piece.

4,105,731

METHOD OF EMBEDDING AN END OF A BUNDLE OF THREAD-LIKE BODIES IN A MOLDING MATERIAL AND CONTROLLING CAPILLARY ACTION BY SAID MATERIAL

Masahiro Yamazaki, Kamakura, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Division of Ser. No. 679,988, Apr. 26, 1976, Pat. No. 4,049,765. This application Jul. 1, 1977, Ser. No. 812,166
Claims priority, application Japan, May 2, 1975, 50-53614
Int. Cl.[2] B29C *5/00*; B29D *3/00*
U.S. Cl. 264—94 **10 Claims**



1. A method for setting an end portion of a bundle of thread-like bodies so that capillary action is reduced between said bodies, comprising the steps of:

A. dipping an end portion of a bundle of threadlike bodies into a solidifiable liquid, said bodies being so disposed that capillaries exist between said bodies;

B. contacting at least that part of said bundle which is immediately adjacent said end portion with a second liquid more wettable to said bundle and lighter than said solidifiable liquid; said contacting step occuring prior to exposure of that adjacent part to said solidifiable liquid whereby said second liquid acts to prevent said capillary action; and

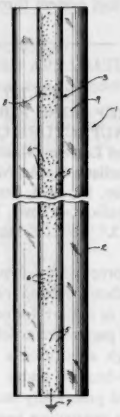
C. permitting said solidifiable liquid to solidify.

4,105,732

RADIOGRAPHIC OPAQUE AND CONDUCTIVE STRIPED MEDICAL TUBES

Eugene L. Slingluff, East Troy, Wis., assignor to Krandex Corp., Milwaukee, Wis.

Division of Ser. No. 634,075, Nov. 21, 1975, Pat. No. 4,027,659. This application Feb. 25, 1977, Ser. No. 772,192
Int. Cl.[2] A61M *25/00*
U.S. Cl. 264—104 **2 Claims**



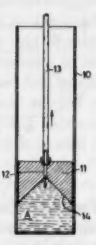
1. The method of making a thermoplastic medicosurgical tubing which is radiographically opaque and conductive, comprising the steps of incorporating with a flexible, waterproof thermoplastic material which is non-conductive and which passes X-rays a mixture of a finely divided non-conductive radiographic opaque material and a finely divided radiographic transparent conductive material to form a thermoplastic composition, and forming a tubing of separate flexible, waterproof thermoplastic material which is non-conductive and which passes X-rays and of said thermoplastic composition with the thermoplastic composition located as an integral narrow strip extending longitudinally throughout the length of the tubing.

4,105,733

METHOD FOR THE PRODUCTION OF A SYNTHETIC MATERIAL HAVING A MOTHER-OF-PEARL LOOK

Ottavio Bonfanti, Via Canova 8, Milan, Italy

Filed Aug. 23, 1976, Ser. No. 716,956
Claims priority, application Italy, May 18, 1976, 23375 A/76
Int. Cl.[2] B29D *31/00*
U.S. Cl. 264—108 **5 Claims**



1. A method for obtaining a bar-like product with a mother-of-pearl look from a hardenable mixture of a fluid synthetic material having a viscosity between 50 and 35,000 centipoises and of a further material for displaying a mother-of-pearl look

when oriented in a preferential direction within the synthetic material, said method comprising the steps of:

(a) providing a vessel having disposed therein a movable wall with the movable wall and a portion of the vessel in combination defining a variable volume mixture receiving chamber;

(b) passing the hardenable mixture through a restricted orifice through the movable wall of the mixture receiving chamber while continuously moving the wall to progressively increase the volume of the chamber at a speed which is chosen between 0.5 and 1.200 cm/min and is directly related to the flow speed of the mixture through the restricted orifice to maintain the increasing volume of the chamber substantially equal to the volume of the dispensed mixture;

(c) hardening the dispensed mixture in the chamber to a viscosity at which the mixture maintains its own shape;

(d) removing the hardened mixture from the chamber.

4,105,734

MARBLE-PATTERNED BATHTUB, BASIN OR SINK

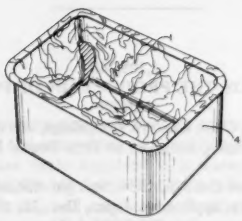
Yasuharu Nakagawa, Suita, Japan, assignor to Topla, Inc., Osaka, Japan

Division of Ser. No. 631,076, Nov. 12, 1975. This application May 27, 1976, Ser. No. 690,545

Claims priority, application Japan, Apr. 25, 1975, 50-51041

Int. Cl.² B29C *9/00, 13/00, 17/00*

U.S. Cl. 264—132 **6 Claims**



1. A method of fabricating a rigid molded article having the appearance of natural marble which comprises heat transferring a printed facsimile of marble from a photograph of natural marble which is imprinted on a transfer printing sheet with a printing ink onto the back of a generally flat sheet of acrylic resin, molding said imprinted acrylic resin sheet into a desired configuration, applying to the back of the printed facsimile an intermediate layer of unsaturated polyester, and then applying a layer of fiber glass reinforced unsaturated polyester resin to the back of the intermediate layer and curing said layers to provide reinforcement and rigidity to said article.

4,105,735

PROCESS FOR FLAMEPROOFING PLASTICS

Franz-Josef Dany, Erftstadt Lechenich; Karl Maier, Augsburg; Tomas Riedel, Biberbach, and Joachim Wortmann, Türnich, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 550,942, Feb. 19, 1975, abandoned. This application Sep. 28, 1976, Ser. No. 727,461

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1974, 2408488

Int. Cl.² C09K *3/28*

U.S. Cl. 264—143 **3 Claims**

1. Process for the flameproofing of a plastic selected from the group consisting of polycaprolactam, polyethylene and polystyrene with a flameproofing agent, which process comprises mixing pulverulent plastic with 5-40% by weight thereof of the flameproofing agent, plasticising and extruding the mixture at elevated temperature and granulating the extruded material, a flameproofing agent being a homogeneous granulate of

10–97% by weight of red phosphorus with a particle size of up to about 100 microns,

3–50% by weight of a binder selected from the group consisting of

(a) the esterification product of ethylene glycol with a wax acid mixture obtained by subjecting crude montana wax to chromic acid oxidation,

(b) a polyethylene wax having a molecular weight of about 2000 and

(c) the glycerol-fatty acid partial ester having a dropping point of 58° C, an acid number of 3 and a saponification number of 180, and

up to 87% by weight of an addend which is melamine, polyacrylonitrile amidosulfonic acid, ammonium bisulfate, copper(II)oxide, Al_2O_3, PbO,MgO, dibromoneopentyl glycol, or a mixture thereof.

4,105,736

SYSTEM FOR THE PRODUCTION OF FINISHED HOLLOW OBJECTS, FORMED FROM A STRIP OF PLASTICS MATERIAL BY HEAT MOULDING

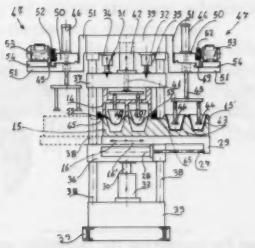
Pietro Padovani, Verona, Italy, assignor to O.M.V. S.p.A., Verona, Italy

Filed Oct. 7, 1976, Ser. No. 730,354

Claims priority, application Italy, Oct. 9, 1975, 84957 A/75

Int. Cl.² B29C *17/02, 17/04*

U.S. Cl. 264—153 **9 Claims**



1. A process for the production of hollow finished objects from a strip of plastic material by heat moulding at a moulding station, said process comprising the steps of:

heating the strip;

feeding the heated strip to the moulding station;

heat moulding at least one object;

cutting the moulded object from the strip at said station;

opening the mould only a distance sufficient to allow further feeding of the strip upon completion of said heat moulding and cutting steps;

further feeding the strip such that the portion of the strip from which the object was removed is out of the moulding station and a further heated portion of the strip is in the moulding station, said further feeding step commencing as soon as the mould is open;

moving a portion of the mould containing the moulded object out of the moulding station and moving a similar portion of the mould into the moulding station simultaneously with said further feeding step;

repeating said heat moulding and cutting steps to form at least one further object upon completion of said further feeding step;

removing the first-mentioned object from the portion of the mould after the expiration of a predetermined stabilization period, said stabilization period beginning with the completion of said heat moulding step and ending during said repeating step.

4,105,737

PROCESS FOR PRODUCING POROUS POLYMER FILM

Takashi Suzuki, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 477,262, Jun. 7, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 710,674

Claims priority, application Japan, Jun. 11, 1973, 48-66660; Feb. 6, 1974, 49-15789

Int. Cl.² B29D *27/00, 7/24*

U.S. Cl. 264—154 **1 Claim**

1. A process for producing a porous polymer film which comprises the steps of:

a. forming many fine cracks in a stretchable polymer having a fine phase separation structure containing a material which is in a fluid state at the stretching temperature and a developed spherulite structure,

b. heating said polymer composition to its stretching temperature under tension so that the said fine cracks may not disappear, said stretching temperature being at a temperature lower than the melting point of the composition and higher than the temperature at which cracks are formed on deformation, and

c. enlarging the fine cracks by plural-axial stretching the polymer composition at the stretching temperature.

4,105,738

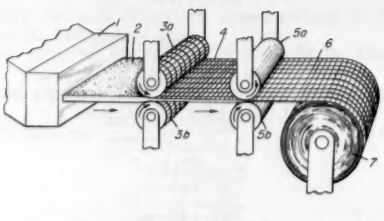
FLEXIBLE PLASTIC FOAM

Charles L. Rohn, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,236

Int. Cl.² B29D *27/00*

U.S. Cl. 264—163 **9 Claims**



1. A process for increasing the flexibility and reducing the thickness of plastic foam sheet, said process comprising:

(a) positioning a sheet of foam plastic material between two rigid surfaces, at least one of said rigid surfaces containing means for fracture of a substantial portion of the cells at the surface of the foam adjacent to said means;

(b) compressing said foam sheet between said rigid surfaces to reduce the thickness of said sheet and rupture by said cell fracturing means a substantial portion of the cells at the surface of said foam sheet; and

(c) removing the compressed foam sheet from between said rigid surfaces, said compressed foam sheet being of reduced thickness and improved flexibility relative to the foam sheet of step (a) above.

4,105,739

CONSTRUCTIONAL ELEMENTS OF CONCRETE

Nalinkumar Jayantilal Dave, Rochdale, England, assignor to University of Salford, England

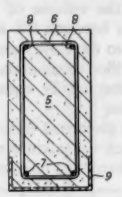
Continuation-in-part of Ser. No. 487,291, Jul. 10, 1974, abandoned. This application Aug. 3, 1976, Ser. No. 711,283

Int. Cl.² B28B *1/16*

U.S. Cl. 264—256 **10 Claims**

1. A method of reinforcing a reinforced concrete structural element having a tensile reinforcing member therein adjacent one surface portion to resist tensile stresses developed in said surface portion under a working load, the method comprising the steps of covering and fixedly joining to said one surface portion an external reinforcing layer of a cement composition incorporating reinforcing fibres disposed in the layer in a random two-dimensional distribution.

3. A method of manufacturing a structure incorporating a reinforced concrete structural element which in use will have at least part of one surface thereof subject to tensile stresses, the method including the steps of casting said element including a tensile reinforcing member adjacent said one surface to resist tensile stress developed in said one surface integrally



with a preformed external reinforcing layer of a cement composition containing reinforcing fibres disposed in the layer with their major axes lying substantially parallel to the surface of the layer in otherwise random orientation, selecting the location and dimensions of said layer so that it covers only that part of the one surface which in use will be subject to tensile stresses, and incorporating said element into the structure so that said part of said one surface is subject to tensile stresses.

4,105,740

PROCESS FOR THE PRODUCTION OF POLYESTER FIBER

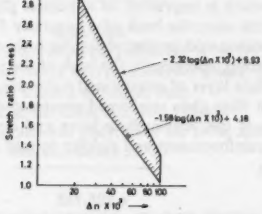
Hiroshi Yasuda, Otsu; Katsuya Tani, Shiga, and Jiro Nagatamo, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Dec. 26, 1974, Ser. No. 536,644

Claims priority, application Japan, Dec. 26, 1973, 48-3896

Int. Cl.² D02J *1/22*

U.S. Cl. 264—290 T **12 Claims**



1. A process for the production of polyster fiber, which comprises melt-spinning a polyethylene terephthalate to form oriented filaments such that the birefringence Δn of the unstretched filaments after spinning is 0.020 to 0.100, bundling the resulting filaments into the form of a tow of at least several tens × 10,000 deniers, and subjecting the tow to stretching at a temperature greater than 100° C and at a stretch ratio satisfying the formula

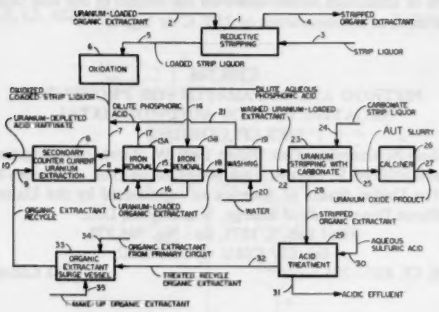
$$-1.58 \log (\Delta n \times 10^3) + 4.18 \leqq DR \leqq -2.32 \log (\Delta n \times 10^3) + 5.93$$

wherein Δn represents the birefringence of the unstretched filaments and DR represents the stretch ratio, the tow takeup speed after stretching being greater than 150 m/min.

4,105,741
PROCESS FOR RECOVERY OF URANIUM FROM WET PROCESS PHOSPHORIC ACID

Tadeusz Karol Wiewiorowski, New Orleans, and Willis Lee Thornsberry, Jr., Gretna, both of La., assignors to Freeport Minerals Company, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,996
Int. Cl.[2] B01D *11/04*
U.S. Cl. 423—10 11 Claims



1. Process for removing iron from an extractant containing uranium values and comprising a dialkylphosphoric acid and a trialkylphosphine oxide dissolved in a water-immiscible organic solvent and having dissolved therein trivalent iron which comprises contacting said extractant with dilute aqueous phosphoric acid containing less than 0.3% by weight of iron at least once to transfer said trivalent iron to said dilute aqueous phosphoric acid and disengaging the dilute aqueous phosphoric acid containing the transferred trivalent iron from said extractant.

8. A process for the recovery of uranium from a wet process phosphoric acid solution derived from the acidulation of uraniferous phosphate ores which comprises

(a) contacting said solution with an organic extractant comprising a dialkylphosphoric acid and a trialkylphosphine oxide dissolved in a water-immiscible organic solvent,
(b) reductively stripping the extractant of uranium with a strip solution in which ferrous iron is used to reduce uranyl ions in the extractant to tetravalent uranium ions in the strip solution,
(c) disengaging the strip solution from the organic phase,
(d) contacting said strip solution with an oxidizer which converts tetravalent uranium to hexavalent form,
(e) contacting the resultant oxidizer-treated solution with an organic extractant having the composition described above,
(f) contacting the resulting extractant with dilute aqueous phosphoric acid containing about 10 to about 40 weight % P_2O_5 and less than 0.3 weight % of iron at least once to transfer said trivalent iron to said dilute aqueous phosphoric acid and disengaging the dilute aqueous phosphoric acid containing the transferred trivalent iron from said extractant, and
(g) stripping the uranium from the organic phase with an aqueous solution of ammonium carbonate to produce a product comprising ammonium uranyl tricarbonate.

4,105,742
SEPARATION AND PURIFICATION OF PLATINUM AND PALLADIUM

Roderick I. Edwards, Honeydew, and Michael J. Nattrass, Randburg, both of South Africa, assignors to The National Institute for Metallurgy, South Africa

Filed Jun. 15, 1977, Ser. No. 806,816
Claims priority, application South Africa, Jun. 21, 1976, 76/3679
Int. Cl.[2] C01G *55/00*
U.S. Cl. 423—22 9 Claims

1. A process for the selective separation of platinum, palladium or both from an aqueous acid solution thereof, wherein the platinum and palladium are present in the form of the chlorocomplexes thereof, the solution being substantially gold free and having an acid concentration of about 0.01 to about 2 molar, the process including the steps of:

(1) contacting said solution with an organic solvent extractant solution which is substantially water insoluble to form an aqueous phase and an organic phase, the solvent extractant solution consisting essentially of an organic liquid solvent having dissolved therein a solvent extractant having functional groups of the formula:

$$R_2N—CH_2COOH$$

were each R, which may be the same or different, is a C_8–C_{16} alkyl group,

said solvent extract having a high capacity and distribution coefficient for both platinum and palladium, facilitating transfer of the platinum chlorocomplex and palladium chlorocomplex to the solvent extractant solution:

(2) separating the solvent extractant solution as an organic phase from the aqueous solution phase;
(3) contacting the thus separated organic solvent extractant solution with a concentrated aqueous hydrochloric acid solution transferring the platinum and palladium to the aqueous hydrochloric acid solution; and thereafter,
(4) recovering the platinum and palladium from the aqueous acid solution.

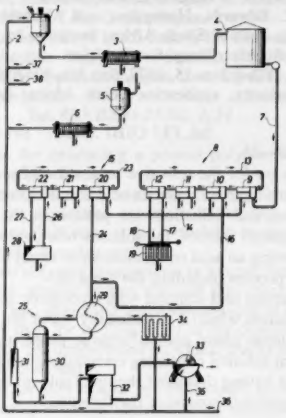
4,105,743
SELECTIVELY EXTRACTING COPPER, ZINC, NICKEL FROM A MIXTURE OF METAL HYDROXIDES

Hans Reinhardt, Västra Frölunda; Harald Daniel Ottertun, Mölndal, and Sven Otto Sigbert Andersson, Kållered, all of Sweden, assignors to Mx-Processer Reinhardt & Co. AB, Mölndal, Sweden

Filed Jun. 15, 1977, Ser. No. 806,939
Claims priority, application Sweden, Jun. 15, 1976, 7606818
Int. Cl.[2] C01G *3/14, 9/00, 53/12*
U.S. Cl. 423—24 2 Claims

1. A process for extracting metals from a mixture of metal hydroxides containing at least one hydroxide of the metals selected from the group consisting of nickel, copper and zinc, and at least one hydroxide of the metals selected from the group consisting of iron and chromium, said process comprising (a) leaching the metal hydroxide mixture with an ammoniacal carbonate solution to dissolve nickel, copper and zinc, said ammoniacal carbonate solution containing free ammonia and ammonium ions in a total content of 3–7 moles per liter and carbonate and hydrogen carbonate ions in a total content of 1–3 moles per liter, (b) recovering by a liquid-liquid extraction process, at least one metal compound from the ammoniacal leaching solution thus obtained, (c) returning the ammoniacal solution to the ammoniacal leaching process, (d) leaching the

solid leaching residue with sulphuric acid at a pH of 1.5–3 to dissolve a further amount of nickel, copper and zinc, and (e)



passing the acidic leaching solution thus obtained to the ammoniacal leaching process.

4,105,744

METHOD OF NEUTRALIZING INDUSTRIAL WASTE GASES

Emerich Erdoess; Josef Marecek; Karel Mocek; Rudolf Camr; Julius Holovacky, and Jiri Prokupek, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Jun. 12, 1975, Ser. No. 586,261

Claims priority, application Czechoslovakia, Jun. 12, 1974, 4159-74; Aug. 2, 1974, 5512-74

Int. Cl.² B01J *8/00;* **C01L** *21/00;* **C01B** *7/00, 17/00*

U.S. Cl. 423—239 **10 Claims**

1. In a method of remaining acidic pollutants comprising oxides of nitrogen and sulfur and silicon tetrafluoride from humid industrial waste gases by producing from a starting material a bed of an active carbonate and thereafter passing the humid waste gases to be treated through the bed, the improvement wherein the producing step employs as a starting material at least one member selected from the group consisting of $MeHCO_3$, $MeHCO_3 . MgCO_3 . y\,H_2O$, $xMeHCO_3 . Me_2CO_3 . y\,H_2O$, and $xMeHCO_3 . Me_2CO_3$, where Me represents an alkaline metal, x is an integer from 1 to 3 and y is an integer from 0 – 4, wherein the producing step comprises heating said starting material to a temperature in the range of 30° – 200° C by contact with a stream of gas having a maximum partial pressure of water vapor defined by the equation.

$$\log P_{H_2O}(\text{Torr}) = 10.825 - \frac{3000}{t^{\circ}\,C + 273}$$

until a substantially hydrate-free active carbonate of the alkaline metal is formed by thermal decomposition of the starting material, and wherein the step of passing the humid waste gases through the bed is accomplished at a temperature in the range of 100° – 200° C.

4,105,745

CATALYST AND PROCESS FOR REDUCING NITROGEN OXIDES

Junji Takeuchi; Shigeru Itou, both of Ube, and Kousuke Itou, Yamaguchi, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Nov. 17, 1975, Ser. No. 632,528

Int. Cl.² C01B *21/00;* **B01J** *27/02, 23/16, 23/84*

U.S. Cl. 423—239 **13 Claims**

9. A process for catalytically reducing nitrogen oxides with ammonia, comprising mixing nitrogen oxide-containing gas with ammonia gas and bringing said mixture gas into contact with a catalyst which comprises a catalyst base consisting essentially of the oxides of iron and chromium and 0.1 through 20% of aluminum sulfate based on the weight of the said catalyst base, at a temperature of 150° C or higher.

4,105,746

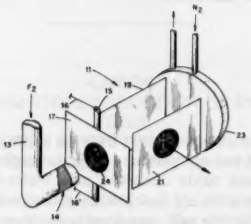
METHOD AND APPARATUS FOR PROVIDING NEGATIVE IONS OF ACTINIDE-METAL HEXAFLUORIDES

Robert N. Compton, Oak Ridge; Paul W. Reinhardt, Kingston, and William R. Garrett, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 7, 1977, Ser. No. 766,278

Int. Cl.² C01G *43/06, 56/00*

U.S. Cl. 423—251 **11 Claims**



1. A method for providing gaseous, negatively charged metal-hexafluoride ions comprising:

in an evacuated zone reacting gaseous fluorine with an actinide-metal body, said metal being selected from the group consisting of uranium, plutonium, neptunium, and americium, to convert at least part of said body to gaseous negative ions of the corresponding metal hexafluoride; and

applying an electric field to the evacuated zone to extract said ions therefrom.

4,105,747

METHOD FOR DEHYDRATING METAL CHLORIDES

Judith A. Eisele, Verdi, and Donald J. Bauer, Reno, both of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 10, 1977, Ser. No. 805,378

Int. Cl.² C01F *5/34, 7/58, 17/00;* **C01G** *9/04*

U.S. Cl. 423—263 **1 Claim**

1. A method for dehydrating a hydrated metal salt, from the group consisting of $ZnCl_2$, $MnCl_2$, $PrCl_3$ $AlCl_3$, $MgCl_2$ and $FeCl_3$, comprising:

dissolving said hydrated metal salt in an organic solvent consisting essentially of a lower aliphatic alcohol,

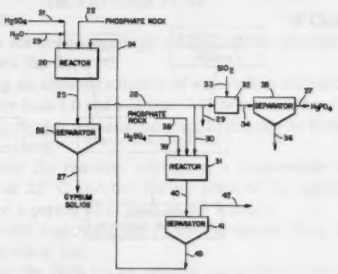
contacting the resulting solution with a crystalline aluminosilicate molecular sieve having a pore size of about 3 to 5 angstroms, sufficient to permit absorption of water molecules but not solvent molecules, at ambient temperature and for a time sufficient to permit substantially complete absorption of water from the hydrated metal salt, and

separating the resulting organic solvent solution of substantially anhydrous metal salt from the molecular sieve.

4,105,748
METHOD OF PRODUCING PHOSPHORIC ACID AND POTASSIUM DIHYDROGEN PHOSPHATE FROM PHOSPHATE ROCK IN THE SUBSTANTIAL ABSENCE OF FLUORINE EVOLUTION

Erhart Karl Drechsel, Houston, Tex., and John B. Sardisco, Shreveport, La., assignors to Pennzoil Company, Shreveport, La.

Division of Ser. No. 696,290, Jun. 15, 1976, Pat. No. 4,055,626. This application Apr. 7, 1977, Ser. No. 785,772
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—320 **7 Claims**



1. A continuous method for the preparation of phosphoric acid and a solution of KH_2PO_4 in phosphoric acid in the substantial absence of fluorine evolution, by the steps which comprise:

(a) reacting in a first acidulation reactor, a fluorine-containing phosphate rock with sufficient sulfuric acid to effect acidulation of the rock, said reaction being conducted in the presence of:

(1) potassium ion provided by addition of a member selected from the group consisting of KH_2PO_4, $KHSO_4$, K_2SO_4, KOH and mixtures thereof in sufficient amounts to combine with the fluorine liberated from the phosphate rock during acidulation and in a sufficient excess amount that the phosphoric acid recovered from the reaction will contain about 0.5 to 1.0 weight percent potassium ion as K_2O; and

(2) in the presence of a sufficient amount of silicon dioxide to combine with the fluorine liberated during acidulation of the rock and a sufficient excess amount of the silicon dioxide to provide about 0.003 to 0.015 parts of silicon dioxide per part of P_2O_5 in the phosphoric acid recovered, said reaction being continued until acidulation of the phosphate rock is substantially complete and adequate gypsum crystal growth is achieved;

(b) forming a resulting mixture of precipitated gypsum and other solids including K_2SiF_6 in phosphoric acid and removing the mixture from the acidulation reactor;

(c) separating the precipitate from the phosphoric acid solution;

(d) dividing the phosphoric acid solution into two portions and recovering one portion of phosphoric acid;

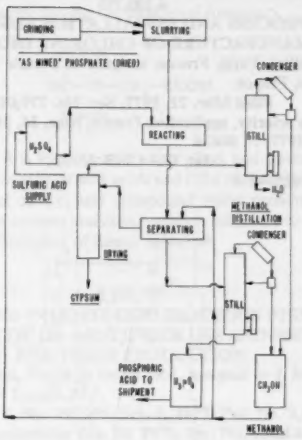
(e) reacting in a second acidulation reactor the other portion of phosphoric acid solution with phosphate rock and a member selected from the group consisting of $KHSO_4$, K_2SO_4 and mixtures thereof, to produce a solution of KH_2PO_4 in H_3PO_4 containing precipitated gypsum and other solids including K_2SiF_6; and

(f) separating the precipitated gypsum and other solids from the solution and recycling the solution to the first acidulation reactor so as to provide potassium ion, silicon dioxide and phosphoric acid thereto.

4,105,749
PHOSPHORIC ACID MANUFACTURE FROM PHOSPHATE MATRIX

Robert A. Wilson, Winter Haven, and David J. Raden, Fort Meade, both of Fla., assignors to Swift Agricultural Chemicals Corporation, Chicago, Ill.

Continuation of Ser. No. 668,715, Mar. 22, 1976, abandoned. This application May 5, 1977, Ser. No. 794,311
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—320 **10 Claims**



1. A method for recovering P_2O_5 values directly from phosphate matrix, comprising mixing unbeneficiated phosphate matrix with a methanol solvent in an amount such that the weight ratio of methanol solvent to matrix is within the range of about 0.6 to 1 to about 2 to 1, so as to form a slurry of said matrix and a single liquid phase comprising said methanol solvent, adding sulfuric acid to said slurry, said sulfuric acid reacting with the matrix in the slurry to extract P_2O_5 values from the matrix and into the liquid phase of the slurry, said liquid phase being primarily P_2O_5 values and methanol, and separating the liquid phase from the solid phase of the slurry.

4,105,750
PRODUCTION OF CARBON BLACKS

John H. Horn, Vizcaya, Spain; William R. Morehead; Ronald C. Hurst, both of Pampa, Tex.; Dennis J. Potter, Milford, Mass., and Clyde D. Schaub, Tulsa, Okla., assignors to Cabot Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 696,771, Jun. 16, 1976, abandoned. This application Nov. 22, 1976, Ser. No. 743,963
Int. Cl.[2] C01B *31/02*; C09C *1/48, 1/56*
U.S. Cl. 423—456 **10 Claims**

1. A modular process for producing furnace carbon blacks having lowered structure characteristics as represented by lowered DBP values of the blacks and increased extrusion shrinkage values of rubber formulations containing said blacks without significantly increasing the particle size of the blacks which comprises (a) reacting a fuel and an oxidant in a first stage so as to provide a stream of combustion gases having a combustion ranging from about 1.25 to about 0.33 equivalence ratio and possessing sufficient energy to convert a carbon black-yielding liquid hydrocarbon feedstock to carbon black; (b) propelling the combustion gas stream in a downstream direction at a high linear velocity into a second stage where the liquid hydrocarbon make is injected in the form of a plurality of coherent jets into the gaseous stream substantially transversely from the periphery of the combustion gas stream and under sufficient pressure to achieve the degree of penetration required for proper shearing and mixing; (c) introducing the

resultant gaseous reaction mixture in a downstream direction into a third zone, the reaction zone, wherein oxidant in an amount of from about 5 to about 45% of the total amount of oxidant required for production of the desired carbon black is injected together with an amount of hydrocarbon sufficient to achieve an equivalence ratio ranging from about 1.25 to 0; (d) terminating the reaction by quenching and recovering the carbon black, the overall combustion of the process ranging from at least 6.67 to about 2.50 equivalence ratio.

4,105,751

PROCESS AND INSTALLATION FOR THE MANUFACTURE OF CHLORINE DIOXIDE

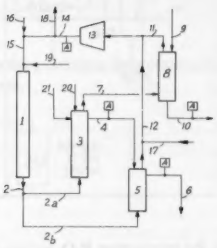
Alain Caillol, Paris, France, assignor to Societe d'Etudes Chimiques, France

Filed Mar. 21, 1977, Ser. No. 779,613

Claims priority, application France, Mar. 24, 1976, 76 08479; Mar. 7, 1977, 77 06634

Int. Cl.² C01B *11/02*

U.S. Cl. 423—478 **30 Claims**



1. In the process for the manufacture of chlorine dioxide which comprises reducing an alkali metal chlorate in an acidic medium by means of a gaseous or liquid reducing agent, in at least one production reaction zone to obtain a liquid effluent and a gaseous effluent, the gaseous effluent containing chlorine dioxide, passing said gaseous effluent through cooled water in a column, and absorbing said chlorine dioxide in said water, recycling the gaseous effluent, referred to as "tail gas" which contains chlorine issuing from said absorption column to said production reaction zone, in order to dilute the chlorine dioxide produced, the improvement which comprises a) contacting said tail gas containing chlorine with an excess of the gaseous or liquid reducing agent, in the presence of water, in an auxiliary reduction zone, thus converting substantially all the chlorine to hydrochloric acid and b) recycling the product from step a) containing hydrochloric acid to said production reaction zone in a recycling circuit.

22. An apparatus for the production of chlorine dioxide which comprises:

(1) an auxiliary reactor for carrying out the reduction of the tail gas containing chlorine, said reactor being equipped with inlet means for feeding respectively said tail gas, a reducing agent and water and outlet means for the gaseous product,

(2) a main reactor for carrying out the reduction of an alkali metal chlorate with an acid to produce chlorine dioxide, means for introducing therein the gaseous product issuing from the outlet means of said auxiliary reactor through the bottom thereof, the main reactor additionally comprising an alkali metal chlorate solution inlet, an acid inlet,

(3) a secondary reactor equipped with inlet means at the bottom for a portion of the gaseous product issuing from the auxiliary reactor, an inlet means for the liquid effluent issuing from the main reactor, an outlet for discharging the residual liquid, an outlet for the residual gas,

(4) a packed absorption column comprising an inlet for the gaseous effluent issuing from the main reactor, a cooled water inlet, whereby chlorine dioxide is dissolved in water, an outlet for discharging the aqueous chlorine dioxide solution, an outlet for discharging the non-absorbed residual gas,

(5) compressing means for the non-absorbed residual gas issuing from the outlet of the absorption column and means for recycling said compressed gas to the inlet of the auxiliary reduction reactor.

4,105,752

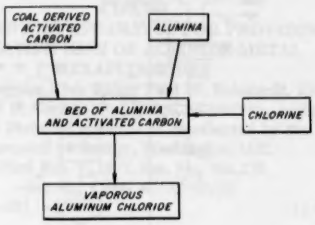
ALUMINUM CHLORIDE PRODUCTION

Aaron J. Becker, Monroeville, and Subodh K. Das, Natrona Heights, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 20, 1976, Ser. No. 752,544

Int. Cl.² C01F *7/56*; C01B *31/20*

U.S. Cl. 423—496 **6 Claims**



1. A process for the production of aluminum chloride from a source of alumina, coal-derived activated carbon and chlorine comprising:

(a) providing a fluidized mixture of coal-derived activated carbon and a source of alumina, the carbon having a size range similar to or larger than the alumina, said activated carbon prepared by:

(i) contacting coal with a leaching solution to remove impurities therefrom, the solution being employed at a temperature of 20° to 100° C and at a ratio of solution in milliliters to coal in grams in the range of 5:1 to 20:1;

(ii) removing the leaching solution from the coal and leaving therein residual leaching solution; and

(iii) calcining the coal at a temperature in the range of 550° to 775° C to provide activated carbon having a dry bulk density in the range of 0.25 to 0.95 gms/cc.

(b) maintaining the mixture at a temperature in the range of 500° to 775° C;

(c) bubbling a source of chlorine through the mixture thereby reacting said chlorine with said alumina to produce aluminum chloride vapor; and

(d) condensing said aluminum chloride vapor.

4,105,753

METHOD FOR SELECTIVE PRODUCTION OF BROMINE

Lothar Schulz, Bad Soden am Taunus, and Hans-Jürgen Arpe, Fischbach, Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 28, 1975, Ser. No. 544,915

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1974, 2404335

Int. Cl.² C01B *7/10, 21/02*

U.S. Cl. 423—502 **16 Claims**

1. A process for the selective production of bromine directly from ammonium bromide which consists essentially of contacting ammonium bromide and an oxygen containing gas with an inorganic oxidation catalyst containing at least one element selected from the group consisting of copper, vanadium, chromium, molybdenum, uranium, manganese, iron, cobalt and rare earth elements of atomic numbers 57 to 71, and mixtures

thereof, reacting said ammonium bromide and oxygen in the presence of said catalyst at about ambient pressure and a temperature of from 200° to 800° C and a reaction time of more than 0.1 second to produce a reaction gas product consisting essentially of bromine, nitrogen and H_2O, and recovering the bromine from said gaseous reaction product.

4,105,754

PRODUCTION OF HIGH PURITY CALCIUM THIOSULFATE

James W. Swaine, Jr., Manlius; William W. Low, Syracuse, and Samuel L. Bean, Jamesville, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 25, 1977, Ser. No. 845,013
Int. Cl.² C01B *17/64*
U.S. Cl. 423—514 **15 Claims**

1. A process for producing high purity calcium thiosulfate which comprises the steps of:

(a) contacting an aqueous solution of ammonium thiosulfate with greater than 1.0 and less than 1.10 of a stoichiometric amount of calcium oxide or calcium hydroxide to form a reaction mixture;

(b) maintaining the reaction mixture at a temperature between about 25° C and the boiling point of the reaction mixture for a period of at least about 3 hours;

(c) continuously removing the formed ammonia from the reaction mixture; and

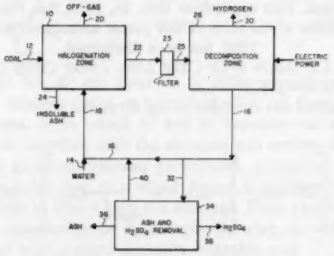
(d) recovering the high purity calcium thiosulfate product.

4,105,755

HYDROGEN PRODUCTION

Alfred J. Darnell, and William E. Parkins, both of Woodland Hills, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 716,320, Aug. 20, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 847,202
Int. Cl.² C01B *1/03*
U.S. Cl. 423—648 R **14 Claims**



1. A method of producing hydrogen comprising the steps of:

(a) reacting an ash containing carbonaceous material, water and at least one halogen selected from the group consisting of chlorine, bromine, and iodine to form reaction products including CO_2, a corresponding hydrogen halide, and ash constituents substantially free of carbonaceous material and containing a minor amount of said halogen;

(b) decomposing the hydrogen halide to produce separate streams of hydrogen and halogen;

(c) recovering the halogen and returning it to step (a) for reaction with additional carbonaceous material and water; and

(d) treating the ash constituents with sulfuric acid to react with said halogen and form a hydrogen halide for recycle to step (b).

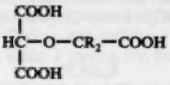
4,105,756

INHIBITION OF DENTAL CALCULUS

David R. Dyroff, Creve Coeur, Mo., and Walton F. Suchanek, Jr., Belleville, Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 24, 1976, Ser. No. 744,484
Int. Cl.² A61K *7/16, 7/24, 9/68, 31/19*
U.S. Cl. 424—48 **20 Claims**

1. An oral composition effective in inhibiting formation of dental calculus, said composition comprising (1) a carboxyalkoxy-propanedioic acid compound selected from the group consisting of acids having the structural formula:



wherein each R is hydrogen or lower alkyl, and pharmaceutically acceptable salts of said acids and (2) a carrier suitable for use in the oral cavity, said compound being present in said composition in amount and concentration sufficient to substantially inhibit formation of dental calculus.

4,105,757

AMORPHOUS PRECIPITATED SILICEOUS PIGMENTS FOR COSMETIC OR DENTIFRICE USE AND METHODS FOR THEIR PRODUCTION

Satish K. Wason, Havre de Grace, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 285,966, Sep. 5, 1972, Pat. No. 3,928,541. This application Feb. 18, 1975, Ser. No. 550,324
Int. Cl.² A61K *7/16*
U.S. Cl. 424—49 **4 Claims**

1. A visually clear toothpaste comprising a binder effective to prevent separation of the solid and liquid phases, a particulate solid polishing agent and an aqueous liquid phase containing an humectant and having substantially the same refractive index as the polishing agent, characterized in that the polishing agent consists essentially of an amorphous precipitated silicic acid having a wet cake moisture content of less than 70%, an oil adsorption of less than about 125 ccs/100 grams, a surface area of less than 100 m^2/g, a pack density of greater than about 12 lb./cu.ft., and a valley abrasion of greater than about 5 mg. wire loss, said precipitated silicic acid being non-opalescent silica aggregates grown to a larger controlled particle size and being present in an amount of from about 15 to about 50 percent by weight of the toothpaste and effective to function to remove stains, food, debris and plaque from the human tooth surface by providing ideal cleaning action at acceptable abrasion levels without imparting undesirable opacity to the toothpaste, thickening said toothpaste, or affecting the viscosity of the toothpaste; said controlled larger particle size of said silica aggregates being thereby free of precipitated silicas which have substantially no cleaning ability on human teeth, have initially small particle sizes, and are free of the ease of breakdown into small particle sizes thus resulting in full cleaning ability.

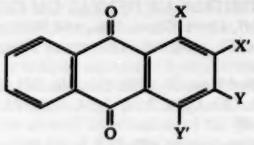
4,105,758

ORAL COMPOSITIONS CONTAINING AN ANTICALCULUS AGENT

Ronald Stanley Schreiber, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,777
Int. Cl.² A61K *7/16*
U.S. Cl. 424—49 **9 Claims**

1. An oral preparation comprising a humectant vehicle containing a dental-calculus inhibiting amount of an anticalculus agent selected from the group consisting of compounds having the structural formula:



wherein X, X', Y, and Y' are selected from the group consisting of H, OH, SO_3Na, and $CH_2N(CH_2COOH)_2$ and wherein at least two of the substituents X, X', Y, and Y' are OH, and at least one of the further substituents are selected from the group consisting of OH, SO_3Na, and $CH_2N(CH_2COOH)_2$.

4,105,759

AMINE MONOFLUOROPHOSPHATES IN DENTIFRICES

Ronald Stanley Schreiber, Highland Park, N.J., and Edward John Duff, Sandbach, England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 782,114
Int. Cl.[2] C07F 9/26; A61K 7/18
U.S. Cl. 424—52 **9 Claims**

1. A bislong chain amine monofluorophosphate which is a substantive, slow release fluoride agent and which has the structural formula:

$$(RNH_3)_2PO_3F$$

wherein R is a unsaturated saturated alkyl or unsaturated alkenyl group containing 8–18 carbon atoms.

4. An anticaries pharmaceutically acceptable oral composition containing an effective amount of the substantive, slow release fluoride agent defined in claim 1 admixed with a pharmaceutical carrier.

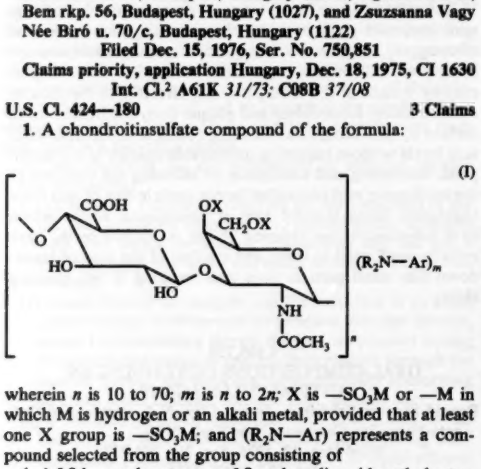
4,105,760

LOCAL ANAESTHETIC SALTS OF CHONDROITINSULFATE COMPOUNDS

József Szejtli, Endrödi Sándor u. 38–40; Éva Dósa, Bimbó u. 131/a, both of Budapest, Hungary (1026); Edömér Tassönyi, Keszkeno u. 37, Budapest, Hungary (1138), Ágoston Dávid, Bem rkp. 56, Budapest, Hungary (1027), and Zsuzsanna Vagy Née Biró u. 70/c, Budapest, Hungary (1122)

Filed Dec. 15, 1976, Ser. No. 750,851
Claims priority, application Hungary, Dec. 18, 1975, CI 1630
Int. Cl.[2] A61K 31/73; C08B 37/08
U.S. Cl. 424—180 **3 Claims**

1. A chondroitinsulfate compound of the formula:



(I)

wherein n is 10 to 70; m is n to $2n$; X is $—SO_3M$ or —M in which M is hydrogen or an alkali metal, provided that at least one X group is $—SO_3M$; and $(R_2N—Ar)$ represents a compound selected from the group consisting of

(−)-3β-benzoyloxytropane-2β-carboxylic acid methyl ester,
2-(cyclohexylamino)-1-methyl-ethyl-benzoate,
3-(2-methyl-piperidino)-propylbenzoate,
2-(diethylaminoacetylamino)-3-methyl-benzoic acid methyl ester,
4-amino-2-chloro-benzoic acid-β-diethylaminoethyl ester,
4-amino-benzoic acid-β-diethylaminoethyl ester,
4-butylamino-benzoic acid-β-diethylaminoethyl ester,
n-butylamino-2-chloro-6-methyl-acetanilide,
4-amino-3-butoxy-benzoic acid-β-diethylaminoethyl ester,
N-(2-diethylaminoethyl)-2-butoxy-cinconinamide,
α-Diethylamino-2,6-dimethyl-acetanilide,
1,2',6'-trimethyl-pipecolinanilide,
2-methyl-α-propylamino-propionanilide and
1-n-butyl-2',6'-dimethyl-pipecolinanilide.

2. A local anaesthetic pharmaceutical composition comprising an effective amount of a compound according to claim 1 and an inert, pharmaceutically acceptable solid or liquid carrier.

4,105,761

ANABOLISANT-ANDROGENIC COMPOUNDS

André Pierdet, Noisy-le-Sec, and Geneviéve Azadian, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Filed Feb. 26, 1975, Ser. No. 553,249
Claims priority, application France, Sep. 20, 1974, 74 31840
Int. Cl.[2] A61K 31/56
U.S. Cl. 424—243 **2 Claims**

1. An androgenic and anabolisant composition comprising an effective amount to obtain androgenic and anabolic activity of 17β-n-amyloxy-$\Delta^{4,9,11}$-estratriene-3-one and an oral pharmaceutical carrier.

2. A method of inducing androgenic and anabolisant activity in humans and other warm-blooded animals comprising orally administering to humans and other warm-blooded animals an androgenic and anabolisant effective amount of 17β-n-amyloxy-$\Delta^{4,9,11}$-estratriene-3-one.

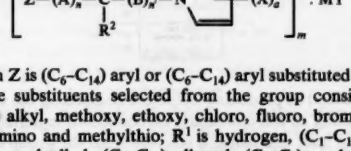
4,105,762

METAL SALT COMPLEXES OF 1-SUBSTITUTED ARALKYL IMIDAZOLES, AND METHODS AND COMPOSITIONS FOR CONTROLLING PHYTOPATHOGENIC FUNGI USING THEM

George A. Miller, Maple Glen, and Harold E. Carley, Chalfont, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 547,291, Feb. 5, 1975, abandoned. This application Dec. 18, 1975, Ser. No. 642,041
The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.
Int. Cl.[2] A01N 9/22; C07F 3/00, 15/00; C07D 233/56
U.S. Cl. 424—245 **9 Claims**

1. A metal salt complex of the formula:



wherein Z is $(C_6–C_{14})$ aryl or $(C_6–C_{14})$ aryl substituted with up to three substituents selected from the group consisting of $(C_1–C_4)$ alkyl, methoxy, ethoxy, chloro, fluoro, bromo, iodo, nitro, amino and methylthio; R^1 is hydrogen, $(C_1–C_{10})$ alkyl, $(C_3–C_7)$ cycloalkyl, $(C_2–C_{12})$ alkenyl, $(C_5–C_7)$ cycloalkenyl, $(C_7–C_9)$ aralkyl or phenyl, or $(C_7–C_9)$ aralkyl or phenyl substituted with up to two substituents selected from the group consisting of $(C_1–C_4)$ alkyl, methoxy, ethoxy, chloro, fluoro, bromo, iodo, nitro, amino and methylthio; R^2 is $(C_1–C_{10})$ alkyl, $(C_3–C_7)$ cycloalkyl, $(C_2–C_{12})$ alkenyl, $(C_5–C_7)$ cycloalkenyl, $(C_7–C_9)$ aralkyl or phenyl or $(C_7–C_9)$ aralkyl or phenyl substituted with up to two substituents selected from the group consisting of $(C_1–C_4)$ alkyl, methoxy, ethoxy, chloro, fluoro, bromo, iodo, nitro, amino and methylthio; R^1 and R^2 taken together form $(C_3–C_8)$ cycloalkyl; A and B are divalent $(C_1–C_5)$ alkylene groups; X is $(C_1–C_4)$ alkyl, halogen or nitro; a is 0 to 3; n is 0 or 1; n' is 0 or 1; and n plus n' is 1 or 2; provided that when Z is unsubstituted phenyl, R^1 is hydrogen, A is

methylene and n' is 0, then R^2 is (C_4–C_{10}) alkyl, (C_3–C_7) cycloalkyl, (C_2–C_{12}) alkenyl, (C_5–C_7) cycloalkenyl, (C_7–C_9) aralkyl or phenyl, or (C_7–C_9) aralkyl or phenyl substituted with up to two substituents selected from the group consisting of (C_1–C_4) alkyl, methoxy, ethoxy, chloro, fluoro, bromo, iodo, nitro, amino and methylthio; m is 1 to 4; M is a metal salt cation selected from the group consisting of calcium, magnesium, manganese, copper, nickel, zinc, iron, cobalt, tin, cadmium, mercury, chromium, lead and barium; and Y is a solubilizing anion counterion selected from the group consisting of chloride, bromide, iodide, sulfate, bisulfate, phosphate, nitrate, perchlorate, carbonate, bicarbonate, hydrosulfide, hydroxide, acetate, oxalate, malate, and citrate.

6. A method for controlling phytopathogenic fungi which consists of applying to a plant, to plant seed or to the plant habitat an effective amount of a complex of claim 2.

9. A fungicidal composition for controlling phytopathogenic fungi which comprises an agronomically acceptable carrier and, as the active ingredient, an effective amount of a complex of claim 1.

4,105,763

1-METHYL-2-(PHENYL-OXYMETHYL)-5-NITRO-IMIDAZOLES

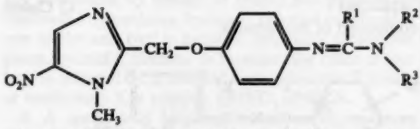
Erhardt Winkelmann, Kelkheim, Taunus, and Wolfgang Raether, Dreieichenhain, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 22, 1976, Ser. No. 734,765

Int. Cl.² A61K *31/415;* **C07D** *233/95;* **A61K** *31/535;* **C07D** *413/12*

U.S. Cl. 424—246 **6 Claims**

1. A 1-methyl-2-(phenyl-oxymethyl)-5-nitro-imidazole of the formula I



(I)

wherein R^1, R^2, R^3 are identical or different and represent hydrogen, straight-chain or branched alkyl of from 1 to 4 carbon atoms, or in which R^1 and R^2 represent an alkylene chain which, together with the nitrogen and carbon atoms to which it is attached, forms a pyrrolidine, piperidine or hexamethylene-imine ring, or in which R^2 and R^3 together with the nitrogen atom to which they are attached, form a pyrrolidine, piperidine, morpholine or thiomorpholine ring, as well as the salts thereof with a physiologically tolerable acid.

6. A method for the treatment of protozoa, helminths and ectoparasites in mammals which comprises administering an effective amount of a compound of the formula I as claimed in claim 1.

4,105,764

4,5-DIHYDRO-5-OXOPYRAZOLO[1,5-A]QUINAZOLINE-3-CARBOXAMIDES

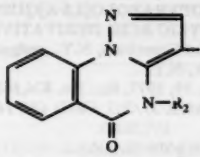
E. John Alexander, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 19, 1977, Ser. No. 826,162

Int. Cl.² A61K *31/505;* **C07D** *487/14, 405/14*

U.S. Cl. 424—248.54 **16 Claims**

1. A compound having the formula:

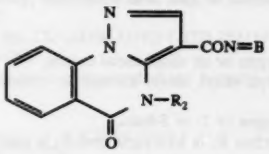


where:

R_2 is lower-alkyl or lower-alkenyl; and

N=B is di-lower-alkylamino, morpholino or pyrrolidino.

16. A composition for the treatment of excess stomach acidity comprising an effectve anti-secretory amount of a compound according to claim 1 having the formula:



where:

R_2 is lower-alkyl or lower-alkenyl; and

N=B is di-lower-alkylamino, morpholino or pyrrolidino in a pharmaceutical carrier.

4,105,765

2-(N-(1,3-DIAMINO-ISOPROPYL)-AMINO)-4-PHENYL-2-IMIDAZOLINES AND SALTS THEREOF

Werner Kummer; Helmut Stahle; Herbert Koppe, all of Ingelheim am Rhein; Walter Haarmann, Biberach an der Riss, and Richard Reichl, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

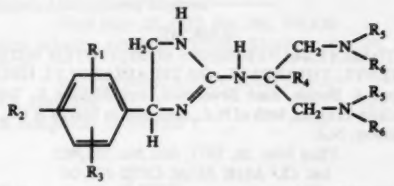
Continuation-in-part of Ser. No. 692,325, Jun. 3, 1976, Pat. No. 4,058,616. This application Sep. 29, 1977, Ser. No. 837,692

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1975, 2525725

Int. Cl.² C07D *413/14;* **A61K** *31/415, 31/495, 31/535*

U.S. Cl. 424—248.56 **6 Claims**

1. A compound of the formula



wherein

R_1 is chlorine, bromine, fluorine or methyl;

R_2 and R_3 are each hydrogen, chlorine or methyl;

R_4 is hydrogen, methyl or ethyl; and

R_5 and R_6, together with each other and the nitrogen atom to which they are attached, are morpholino, piperazino or N-methyl-piperazino;

or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

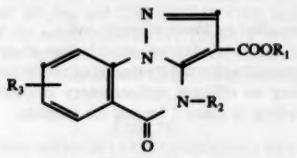
5. An antithrombotic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective antithrombotic amount of a compound of claim 1.

4,105,766
4,5-DIHYDRO-5-OXOPYRAZOLO[1,5-A]QUINAZOLINE-3-CARBOXYLIC ACID DERIVATIVES

E. John Alexander, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

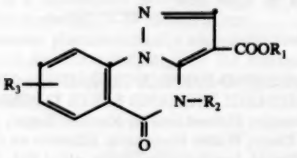
Filed Aug. 19, 1977, Ser. No. 826,163
Int. Cl.[2] A61K *31/505;* C07D *487/14*
U.S. Cl. 424—251 53 Claims

1. A compound having the formula:



where:
R_1 is hydrogen or an alkali metal cation;
R_2 is methyl, ethyl, lower-alkenyl or cyclopropylmethyl; and
R_3 is hydrogen or 7- or 8-halo,
except that when R_1 is hydrogen and R_2 is methyl, R_3 is not 7-fluoro.

52. A composition for the treatment of allergic conditions comprising a pharmaceutical carrier together with an anti-allergically effective amount of a compound having the formula:



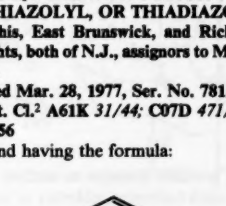
where:
R_1 is hydrogen, lower-alkyl or pivaloyloxymethyl;
R_2 is hydrogen, methyl, ethyl, lower-alkenyl or cyclopropylmethyl; and
R_3 is hydrogen, 7- or 8-methyl, 7- or 8-halo or 7-nitro,
except that (a) when R_1 is lower-alkyl and R_2 is hydrogen, R_3 is not 8-methyl or 7-fluoro, (b) when R_1 is lower-alkyl and R_2 is methyl, R_3 is not 7-methyl or 7-bromo, and (c) when R_1 is hydrogen and R_2 is methyl, R_3 is not 7-fluoro.

4,105,767
IMIDAZO[1,2-a] PYRIDINES SUBSTITUTED WITH A THIENYL, THIAZOLYL, OR THIADIAZOLYL GROUP

Richard J. Bochis, East Brunswick, and Richard L. Tolman, Berkley Heights, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

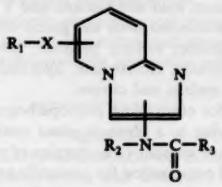
Filed Mar. 28, 1977, Ser. No. 781,902
Int. Cl.[2] A61K *31/44;* C07D *471/04*
U.S. Cl. 424—256 9 Claims

1. A compound having the formula:



wherein
X is oxygen, thio, sulfinyl or sulfonyl;
R_1 is thienyl, thiazolyl or thiadiazolyl, which are optionally substituted with a loweralkyl, amino or phenyl group;
R_2 is hydrogen or loweralkyl; and
R_3 is loweralkoxy.

9. An anthelmintic composition which comprises an inert carrier and a compound having the formula:



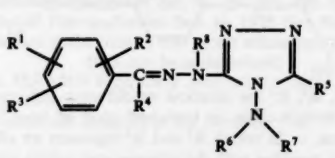
wherein
X is oxygen, thio, sulfinyl or sulfonyl;
R_1 is thienyl, thiazolyl or thiadiazolyl, which are optionally substituted with a loweralkyl, amino or phenyl group;
R_2 is hydrogen or loweralkyl; and
R_3 is lower alkoxy.

4,105,768
HYPOTENSIVE SUBSTITUTED 1,2,4-TRIAZOLES

Hans Erik Eriksson, Sundsvall, and Gösta Lennart Florvall, Södertälje, both of Sweden, assignors to Astra Läkemedel Aktiebolag, Södertälje, Sweden

Continuation-in-part of Ser. No. 637,664, Dec. 4, 1975, abandoned, which is a division of Ser. No. 478,228, Jun. 11, 1974, Pat. No. 3,959,476, and a continuation-in-part of Ser. No. 635,140, Nov. 25, 1975, Pat. No. 4,022,905. This application Mar. 21, 1977, Ser. No. 779,582
Claims priority, application Sweden, Jun. 14, 1973, 7308365; Norway, Dec. 11, 1974, 744468/74
Int. Cl.[2] A61K *31/44;* C09B *23/16, 55/00*
U.S. Cl. 424—263 12 Claims

1. A compound of the formula



I

or a pharmaceutically acceptable salt thereof wherein R^1, R^2 and R^3 are the same or different and each represents a hydrogen atom, a lower alkyl group or a halogen atom, R^4 represents a pyridyl group, and R^5, R^6, R^7 and R^8 are the same or different and each represents a hydrogen atom or a lower alkyl group.

5. A hypotensive pharmaceutical preparation which comprises as active ingredient a therapeutically effective amount of at least one compound according to claim 1, or a pharmaceutically acceptable salt thereof, in association with a pharmaceutically acceptable carrier.

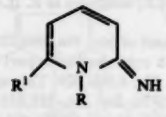
4,105,769
INHIBITION OF INDOLEAMINE-N-METHYL TRANSFERASE BY 2-IMINOPYRIDINES

Clarence S. Rooney, Beaconsfield; Joshua Rokach, Laval, both of Canada, and Edward J. Cragoe, Jr., Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 24, 1977, Ser. No. 761,748
Int. Cl.[2] A61K *31/44;* C07D *211/72*
U.S. Cl. 424—263 4 Claims

1. A method of inhibiting indoleamine-N-methyl-transferase which comprises administering to a patient in need of such

treatment an effective enzyme-inhibiting amount of a compound of formula:



or a pharmaceutically acceptable salt thereof, wherein

R is lower alkyl,

R^1 is hydrogen or amino, and the broken line represents saturation or unsaturation.

4. The compound, 2-imino-1-methyl-1,2,5,6-tetrahydropyridine.

4,105,770

HETEROCYCLOMETHYLSULPHINYLETHYL DERIVATIVES OF N-CYANOGUANIDINES, THIOUREAS AND 2-AMINO-1-NITROETHYLENE

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, England; Torben Hesselbo, North Berwick, Scotland, and George Raymond White, Harpenden, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

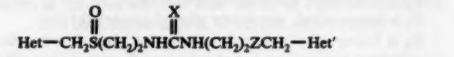
Division of Ser. No. 704,871, Jul. 13, 1976, Pat. No. 4,038,408. This application Apr. 13, 1977, Ser. No. 787,245

Claims priority, application United Kingdom, Jul. 31, 1975, 31969/75

Int. Cl.[2] C07D *417/02, 403/02;* A61K *31/44*

U.S. Cl. 424—263 10 Claims

1. A compound of the formula:



wherein Het and Het' are each selected from imidazole optionally substituted by methyl or bromo and pyridine optionally substituted by methoxy, hydroxy, chlorine or bromine or when one of Het and Het' is pyridine optionally substituted by methoxy, hydroxy, chlorine or bromine, the other of Het or Het' may be selected from thiazole and isothiazole; Z is sulphur, SO or methylene; X is sulphur, $CHNO_2$ or NCN.

9. A method of blocking histamine H_2-receptors which comprises administering to an animal in an amount effective to block said receptors a compound of claim 1.

4,105,771

1-AMINOALKYLPIPERIDINE DERIVATIVES

John Leheup Archibald, Windsor, and Terence James Ward, Cippenham, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

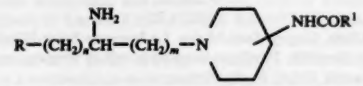
Filed Jun. 9, 1977, Ser. No. 805,203

Claims priority, application United Kingdom, Jun. 23, 1976, 26099/76

Int. Cl.[2] C07D *211/58*

U.S. Cl. 424—267 6 Claims

1. A compound having the formula



and the pharmaceutically acceptable acid addition and quaternary ammonium salts thereof, wherein NHCOR[1] is in the 4-position; R represents phenyl or phenyl substituted by halogen, lower alkyl, hydroxy, trifluoromethyl or lower alkoxy; *n* represents 0 or 1 and *m* represents 2 or 3 with the proviso that *n* plus *m* equals 3; and R^1 represents phenyl or phenyl substituted by halogen, lower alkyl, lower alkoxy, trifluoromethyl or hydroxy.

4,105,772

3-NITROPYRAZOLE COMPOUNDS AND ANTI-MICROBIAL COMPOSITIONS

Herbert Berger, Mannheim-Käfertal; Rudi Gall, Hirschberg-Grossachsen, both of Germany; Kurt Stach, deceased, late of Mannheim-Waldorf, Germany, by Werner Plattner, administrator; Max Thiel, Mannheim, Germany, and Wolfgang Vömel, Mannheim, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

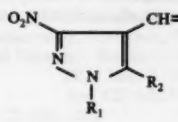
Filed Nov. 22, 1976, Ser. No. 744,215

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558117

Int. Cl.[2] A61K *31/41;* C07D *231/10*

U.S. Cl. 424—269 11 Claims

1. 3-Nitropyrazole compound of the formula:



(I)

wherein

R_1 is lower alkyl;

R_2 is hydrogen or lower alkyl;

R_3 is cyano, carboxyl, or lower alkoxycarbonyl; and pharmaceutically acceptable salts thereof.

9. Method of combatting microbial infections which method comprises administering to the afflicted subject anti-microbially effective amounts of a 3-nitropyrazole compound as claimed in claim 1.

4,105,773

4-AMIDO-2-ALKOXY THIAZOLES AND COMPOSITION

Roger Crossley, Reading, and David George Hill, Cookham, both of United Kingdom, assignors to John Wyeth & Brother Limited, Maidenhead, England

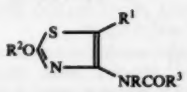
Filed May 23, 1977, Ser. No. 799,820

Claims priority, application United Kingdom, Jun. 10, 1976, 24162/76

Int. Cl.[2] A61K *31/425;* C07D *277/02*

U.S. Cl. 424—270 12 Claims

1. A compound of formula I,



(I)

wherein R is hydrogen, alkyl of 1–6 carbon atoms, or COR^3 where R^3 is hydrogen, alkyl of 1–5 carbon atoms, alkenyl of 2 to 5 carbon atoms, alkynyl of 2 to 5 carbon atoms, or cycloalkyl of 3 to 5 carbon atoms, R^1 is hydrogen or alkyl of 1–6 carbon atoms, R^2 is alkyl of 1–6 carbon atoms and R^3 is as above defined.

10. A pharmaceutical composition for use in the treatment of ulcers or hypersecretion which comprises a therapeutically effective amount of a compound as claimed in claim 1 and a pharmaceutically acceptable carrier.

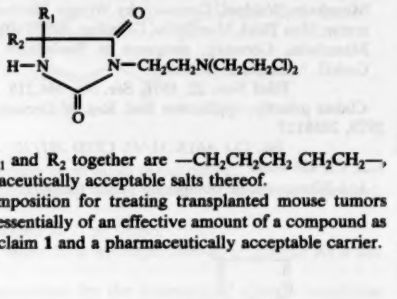
4,105,774

HYDANTOIN COMPOUNDS AND METHODS OF USE THEREOF

John S. Driscoll, Rockville, Md.; Victor E. Marquez, Caracas, Venezuela, and Geoffrey Peng, Chicago, Ill., assignors to The United States of America as represented by the Secretary of State, Washington, D.C.

Filed Jul. 28, 1975, Ser. No. 599,602
Int. Cl.² H61K 31/415; C07D 233/20
U.S. Cl. 424—273 R 3 Claims

1. A compound selected from the group consisting of



wherein R_1 and R_2 together are $—CH_2CH_2CH_2$ $CH_2CH_2—$, and pharmaceutically acceptable salts thereof.

2. A composition for treating transplanted mouse tumors consisting essentially of an effective amount of a compound as defined in claim 1 and a pharmaceutically acceptable carrier.

4,105,775

FUNGICIDAL DISPERSIONS OF 2-BENZIMIDAZOLE-METHYL-CARBAMATE

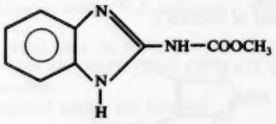
Konrad Albrecht, Fischbach, Taunus; Heinz Frensch, Frankfurt am Main, and Kurt Hartel, Hofheim, Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 634,658, Nov. 24, 1975, abandoned, which is a continuation of Ser. No. 519,040, Oct. 29, 1974, abandoned. This application Apr. 11, 1977, Ser. No. 786,497
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1973, 2354468
Int. Cl.² A01N 9/22
U.S. Cl. 424—273 R 2 Claims

1. A fungicidally active composition of

(a) about 5 to 30 percent by weight of the compound of the formula

I



(b) dispersed in about 60 to 85 percent by weight of a liquid diester of an aliphatic or alicyclic (C_1–C_{12}) monoalcohol and phthalic acid,

(c) about 2 to 10 percent by weight of a combination of octylphenol polyglycol ether and castor oil polyglycol ether, said octylphenol polyglycol ether having from 5 to 14 glycol units and said castor oil polyglycol ether comprising 1.5 to 3 percent by weight of said combination and having from 30 to 50 glycol units and

(d) about 0.1 to 5 percent by weight of Ca-(C_8–C_{15})-monoalkyl benzene sulfonate.

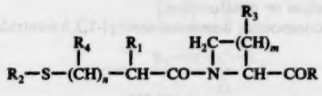
4,105,776

PROLINE DERIVATIVES AND RELATED COMPOUNDS

Miguel Angel Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 698,432, Jun. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 657,792, Feb. 13, 1976, Pat. No. 4,046,889. This application Dec. 22, 1976, Ser. No. 751,851
Int. Cl.² H61K 31/40; C07D 403/12, 207/16
U.S. Cl. 424—274 42 Claims

1. A compound of the formula

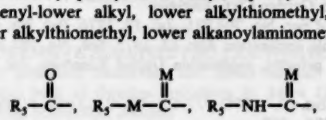


wherein

R is hydroxy, NH_2 or lower alkoxy;

R_1 and R_4 each is hydrogen, lower alkyl, phenyl or phenyl-lower alkyl;

R_2 is hydrogen, lower alkyl, phenyl, substituted phenyl wherein the phenyl substituent is halo, lower alkyl or lower alkoxy, phenyl-lower alkyl, diphenyl-lower alkyl, triphenyl-lower alkyl, lower alkylthiomethyl, phenyl-lower alkylthiomethyl, lower alkanoylaminomethyl,

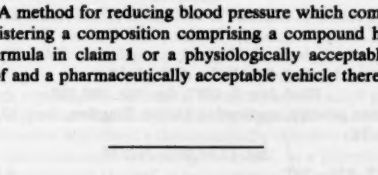


R_6—S— or R_7;

R_3 is hydrogen, hydroxy or lower alkyl;

R_5 is lower alkyl, phenyl or phenyl-lower alkyl;

R_6 is lower alkyl, phenyl, substituted phenyl, wherein the phenyl substituent is halo, lower alkyl or lower alkoxy, hydroxy-lower alkyl or amino(carboxy)lower alkyl;



M is O or S;

m is 2;

n and *p* each is 0, 1 or 2; and basic salts thereof, said lower alkoxy, lower alkyl and lower alkanoyl groups having up to seven carbon atoms.

35. A method for reducing blood pressure which comprises administering a composition comprising a compound having the formula in claim 1 or a physiologically acceptable salt thereof and a pharmaceutically acceptable vehicle therefor.

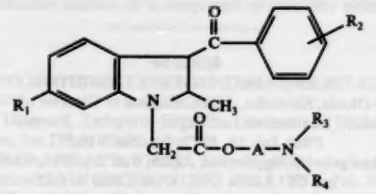
4,105,777

INDOLES

André Allais, Gagny; Jean Meier, La Varenne Saint-Hilaire, and Roger Deraedt, Pavillons-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Filed Jan. 12, 1977, Ser. No. 758,633
Claims priority, application France, Jan. 21, 1976, 76 01560; Oct. 1, 1976, 76 29652
Int. Cl.² A61K 31/40; C07D 209/20
U.S. Cl. 424—274 19 Claims

1. A compound selected from the group consisting of indoles of the formula



wherein R_1 is selected from the group consisting of hydrogen, halogen, $—CF_3$, alkyl of 1 to 8 carbon atoms and alkoxy of 1 to 8 carbon atoms, R_2 is in the 2, 3 or 4 position and is selected from the group consisting of halogen, $—CF_3$ and alkyl, alkoxy and alkylthio of 1 to 8 carbon atoms, A is selected from the group consisting of branched alkylene of 3 to 5 carbon atoms and $—(CH_2)_n—$ and n is a number of 2 to 5 and R_3 and R_4 are alkyl of 1 to 8 carbon atoms and their non-toxic, pharmaceutically acceptable acid additions salts.

16. An analgesic composition comprising an analgesically effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

18. A method of relieving pain in warm-blooded animals comprising administering to warm-blooded animals an analgesically effective amount of at least one compound of claim 1.

4,105,778

FUSED γ-PYRONE-2-CARBOXYLIC ACID DERIVATIVES AND PROCESS THEREFOR

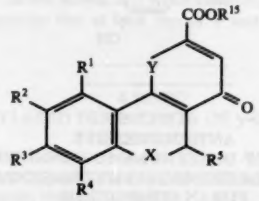
Adolph H. Philipp, St. Laurent, and Ivo L. Jirkovsky, Montreal, both of Canada, assignors to Ayerst, McKenna & Harrison, Ltd., Montreal, Canada

Division of Ser. No. 649,113, Jan. 14, 1976, Pat. No. 4,060,619. This application Sep. 8, 1977, Ser. No. 831,448

Int. Cl.² A61K *31/38*

U.S. Cl. 424—275 **20 Claims**

1. A compound of formula I



in which R^1, R^2, R^3 and R^4 are the same or different selected from the group consisting of hydrogen halogen and lower alkyl; R^5 is hydrogen or lower alkyl; R^{15} is hydrogen or lower alkyl; X is O, S, SO or SO_2; and Y is O or a pharmaceutically acceptable salt thereof.

9. 9-(1-Methylpropyl)-4-oxo-4H,5H-[1]benzothiopyrano[4,3-b]pyran-2-carboxylic acid, as claimed in claim 1.

4,105,779

ANTHELMINTIC PROCESS FOR DOMESTIC ANIMALS

Hidetoshi Kobayashi, and Kohei Araki, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 544,609, Jan. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 122,183, Mar. 8, 1971, abandoned. This application Jan. 24, 1977, Ser. No. 762,077

Claims priority, application Japan, Mar. 10, 1970, 45-19722

Int. Cl.² A61K *31/74, 31/745, 31/66*

U.S. Cl. 424—78 **10 Claims**

1. A process for combatting gastro-intestinal worms in poultry or warm-blooded domestic animals which comprises orally administering to said poultry or warm-blooded domestic animals an anthelmintic effective amount of a composition comprising a complex chemical compound of the calcium salt of O-methyl-O-(2,2-dichlorovinyl)phosphoric acid with O,O-dimethyl-O-(2,2-dichlorovinyl)phosphate and a thermoplastic resin comprising a co-polymer obtained by copolymerizing 30 to 60 wt. parts of a conjugated diene compound selected from the group consisting of butadiene, isoprene and chloroprene with 70 to 40 wt. parts of a monovinyl monomer compound copolymerizable with said diene compound and selected from the group consisting of ethylene, propylene, styrene, vinyl chloride, vinyl acetate, acrylonitrile, methyl acrylate, vinyl butyl ether, vinylidene chloride, methacrylaonitrile, alpha-methylstyrene, and methacrylate, in the presence of from 0.5 to 5.0 wt. parts of divinylbenzene as a cross-linking agent.

4,105,780

INSECTICIDAL AND ACARICIDAL M-PHENOXYBENZYL ESTERS OF 2,2-DIFLUORO-1,3-BENZODIOXOLE-5-(α-ALKYL)ACETIC ACIDS

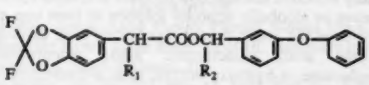
Gerald Berkelhammer, Princeton, N.J., and Venkatamaran Kameswaran, Levittown, Pa., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 3, 1977, Ser. No. 774,090

Int. Cl.² A01N *9/28;* C07D *317/44*

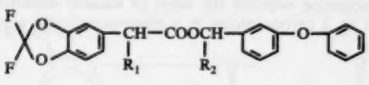
U.S. Cl. 424—282 **15 Claims**

1. A compound having the formula:



wherein R_1 is ethyl, n-propyl or i-propyl and R_2 is hydrogen or cyano.

15. An insecticidal/acaricidal composition comprising an insecticidally or acaricidally effective amount of a compound having the formula



wherein R_1 is ethyl, n-propyl or i-propyl and R_2 is hydrogen or cyano;

an emulsifying agent,

a surfactant and

solvent.

4,105,781

CHROMONE COMPOUNDS AND PREPARATION THEREOF

Suminori Umio, Kawanishi; Shizuo Maeno, Osaka; Ikuo Ueda, Yao; Yoshinari Sato, Takaishi, and Masaaki Matsuo, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 679,140, Apr. 22, 1976, Pat. No. 4,049,664, which is a division of Ser. No. 213,180, Dec. 28, 1971, Pat No. 3,965,122.

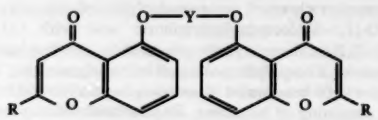
This application Apr. 19, 1977, Ser. No. 788,735

Claims priority, application Japan, Dec. 30, 1970, 45-129469; Dec. 30, 1970, 45-129470

Int. Cl.² C07D *407/14;* A61K *31/34*

U.S. Cl. 424—283 **4 Claims**

1. A chromone compound selected from the group consisting of


[I]

wherein R is furyl and Y is hydroxy (lower) alkylene.

4. A pharmaceutical composition comprising, as an active ingredient, the compound of claim 1 and a pharmaceutically acceptable carrier.

4,105,782

TREATMENT OF ACNE AND DANDRUFF

Ruey J. Yu, 4400 Dexter St., Philadelphia, Pa. 19128, and Eugene J. Van Scott, 1138 Sewell La., Rydal, Pa. 19046

Continuation-in-part of Ser. No. 556,423, Mar. 7, 1975, Pat. No. 3,988,470, and Ser. No. 556,424, Mar. 7, 1975, Pat. No. 3,984,566, each is a division of Ser. No. 445,231, Feb. 25, 1974, Pat. No. 3,920,835, which is a continuation-in-part of Ser. No. 394,269, Sep. 4, 1973, Pat. No. 3,879,537. This application Sep. 7, 1976, Ser. No. 720,787

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/35*

U.S. Cl. 424—283 **9 Claims**

1. A method for alleviating the symptoms of acne or dandruff in humans: topically applying to involved areas of the body an effective amount of a composition comprising: a therapeutically effective amount of a product prepared by reacting, in aqueous or alcoholic aqueous solution at least one member selected from the group consisting of citric acid, glycolic acid, glucuronic acid, galacturonic acid, glucuronolactone, gluconolactone, α-hydroxy-butyric acid, α-hydroxyisobutyric acid, malic acid, pyruvic acid, β-phenyllactic acid, β-phenylpyruvic acid, saccharic acid, mandelic acid, tartaric acid, tartronic acid and β-hydroxybutyric acid and a base selected from the group consisting of ammonium hydroxide, an organic primary, secondary, or tertiary alkylamine, alkanol amine, diamine, dialkylamine, dialkanolamine, alkylalkanol amine, trialkylamine, trialkanol amine, dialkyl alkanol amine, or alkyl dialkanolamine wherein the alkyl or alkanol substituent has from 1 to 8 carbon atoms in a pharmaceutically acceptable vehicle.

4,105,783

THERAPEUTIC TREATMENT OF DRY SKIN

Ruey J. Yu, 4400 Dexter St., Philadelphia, Pa. 19128, and Eugene J. Van Scott, 1138 Sewell La., Rydal, Pa. 19046

Continuation-in-part of Ser. No. 598,224, Jul. 23, 1975, Pat. No. 4,021,572. This application Sep. 7, 1976, Ser. No. 720,835

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/35*

U.S. Cl. 424—283 **15 Claims**

1. A non-irritating method for alleviating the symptoms of dry skin in humans comprising: topically applying to involved areas of the body an effective amount of a composition comprising: a therapeutically effective amount of a product prepared by reacting, in aqueous or alcoholic aqueous solution at least one member selected from the group consisting of citric acid, glycolic acid, glucuronic acid, galacturonic acid, glucuronolactone, gluconolactone, α-hydroxybutyric acid, α-hydroxyisobutyric acid, lactic acid, malic acid, mandelic acid, mucic acid, pyruvic acid, methyl pyruvate, ethyl pyruvate, β-phenyllactic acid, β-phenylpyruvic acid, saccharic acid, tartaric acid, tartronic acid, and β-hydroxybutyric acid and a base selected from the group consisting of ammonium hydroxide, an organic primary, secondary, or tertiary alkylamine, alkanolamine, diamine, dialkylamine, dialkanolamine, alkylalkanolamine, trialkylamine, trialkanol amine, dialkyl alkanol amine, or alkyl dialkanolamine wherein the alkyl or alkanol substituent has from 1 to 8 carbon atoms in a pharmaceutically acceptable vehicle.

4,105,784

PLANT VIRAL DISEASE INHIBITOR

Fumio Okada, Shizuoka, Japan, assignor to Director of National Research Institute of Tea, Japan

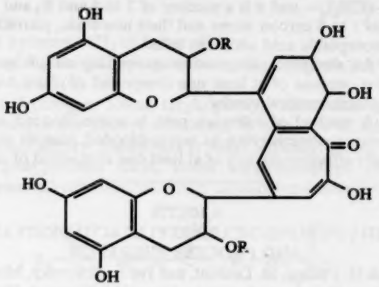
Filed Jul. 18, 1977, Ser. No. 816,517

Claims priority, application Japan, Jul. 23, 1976, 51-87248

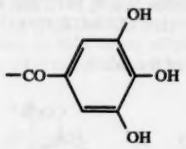
Int. Cl.[2] A01N *9/23, 9/08;* C07D *311/02*

U.S. Cl. 424—283 **7 Claims**

1. A method for inhibiting viral diseases in plants comprising the steps of applying a plant viral disease inhibitor thereto, said inhibitor comprising a substance selected from the group consisting of theoflavin and its derivatives represented by the general formula:



wherein R is hydrogen or



4,105,785

ANTI-DEPRESSIVE 2-METHYL-4-[(3'-DIMETHYLAMINO)PROPYLIDINE]-9,10-DIHYDROBENZO [4,5]CYCLOHEPTA[1,2b] FURAN COMPOUNDS

Roland Yves Mauvernay, Riom; Norbert Busch, la Tourette, and Jacques Moleyre, Menetrol, all of France, assignors to Centre Europeen de Recherches Mauvernay, Riom, France

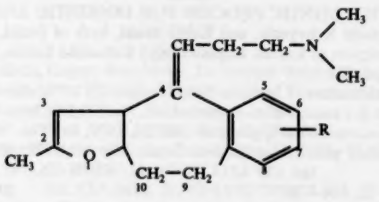
Filed Mar. 16, 1977, Ser. No. 778,239

Claims priority, application France, Mar. 17, 1976, 76 07698

Int. Cl.[2] A61K *31/335;* C07D *307/93*

U.S. Cl. 424—285 **3 Claims**

1. Tricyclic compounds comprising a furan ring, which correspond to the formula:



wherein R is hydrogen or a lower alkyl radical.

3. A method of treatment of depressive syndromes which

comprises administering to a host in need thereof a therapeutically effective amount of a compound of claim 1.

4,105,786

ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF

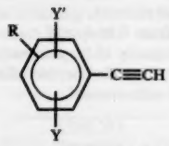
Julius Diamond, Lafayette Hill, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 574,837, May 14, 1975, which is a continuation of Ser. No. 431,257, Jan. 7, 1974, Pat. No. 3,923,910, which is a division of Ser. No. 268,419, Jul. 3, 1972, Pat. No. 3,852,364. This application Jan. 11, 1977, Ser. No. 758,461

Int. Cl.[2] A61K *31/255;* C07C *147/06*

U.S. Cl. 424—303 14 Claims

1. A method of treating inflammation, pain or fever in warm-blooded animals which comprises administering to a warm-blooded animal an effective amount of an active agent which is a compound of the formula



where

R is selected from the group consisting of hydrogen, alkyl of 1 to 7 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, 1 to 7 carbon atoms alkyl substituted cycloalkyl of 5 to 7 carbon atoms, phenyl or substituted phenyl where the substituent is Y'';

Y and Y' are each selected from the group consisting of hydrogen, alkylsulfinyl of 1 to 7 carbon atoms, and alkylsulfonyl of 1 to 7 carbon atoms,

Y'' is selected from the group consisting of Y, lower alkyl of 1 to 7 carbon atoms, and trifluoromethyl,

with the proviso that at least one of Y and Y' is other than hydrogen.

4,105,787

DIACYLATED DERIVATIVES OF γ-GLUTAMYL DOPAMINE

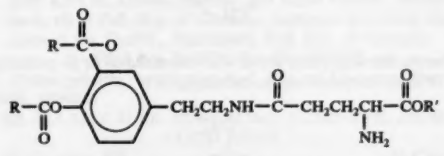
Peter Hadley Jones, Lake Forest; Carroll Wayne Ours, Zion, and Jaroslav Kyncl, Lake Bluff, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 612,511, Sep. 11, 1975, Pat. No. 4,031,242. This application May 3, 1977, Ser. No. 793,467

Int. Cl.[2] A61K *31/24;* C07C *69/76*

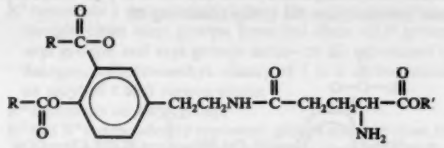
U.S. Cl. 424—309 10 Claims

1. A diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



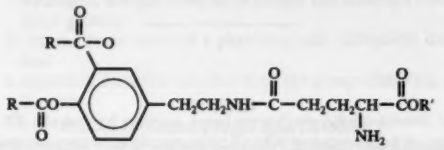
where R is a phenyl ring or benzyl and R' is H or a C_1–C_7 alkyl, and a pharmaceutically acceptable acid addition salt thereof.

7. A method of increasing renal blood flow of warm-blooded animals which comprises administering to said mammals at least an effective amount of a renal vasodilator compound comprising a diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



where R is a phenyl ring or benzyl and R' is H or a C_1–C_7 alkyl, and a pharmaceutically acceptable acid addition salt thereof.

9. The pharmaceutical composition in unit dosage form effective in increasing renal blood flow which comprises an active portion comprising a diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



where R is a phenyl ring or benzyl and R' is H or a C_1–C_7 alkyl, and a pharmaceutically acceptable carrier.

4,105,788

DIACYLATED DERIVATIVES OF GAMMA GLUTAMYL DOPAMINE

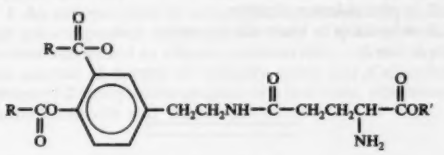
Peter Hadley Jones, Lake Forest; Carroll Wayne Ours, Zion, and Jaroslav Kyncl, Lake Bluff, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 612,511, Sep. 11, 1975, Pat. No. 4,031,242. This application May 3, 1977, Ser. No. 793,468

Int. Cl.[2] A61K *31/24;* C07C *101/24*

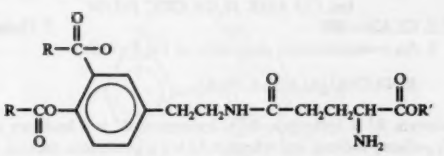
U.S. Cl. 424—309 8 Claims

1. A diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



where R is a C_1–C_{12} straight or branched chain alkyl radical, and R' is a C_1–C_7 alkyl, and a pharmaceutically acceptable acid addition salt thereof.

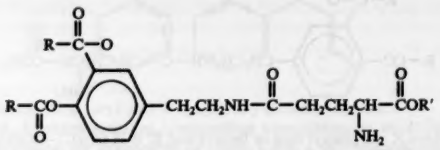
5. A method of increasing renal blood flow of warm-blooded animals which comprises administering to said mammals at least an effective amount of a renal vasodilator compound comprising a diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



where R is a C_1–C_{12} straight or branched chain alkyl radical, and R' is a C_1–C_7 alkyl, and a pharmaceutically acceptable acid addition salt thereof.

7. A pharmaceutical composition in unit dosage form effective in increasing renal blood flow which comprises an active

portion comprising a diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



where R is a C_1–C_{12} straight or branched chain alkyl radical, and R′ is a C_1–C_7 alkyl, and a pharmaceutically acceptable carrier.

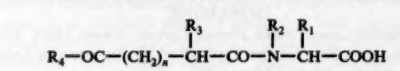
4,105,789

CARBOXYALKYLACYLAMINO ACIDS

Miguel Angel Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 10, 1976, Ser. No. 684,605
Int. Cl.² A61K *31/195, 31/215;* C07C *103/84*
U.S. Cl. 424—309 **10 Claims**

1. A compound of the formula



and physiologically acceptable salts thereof, wherein

R_1 is hydrogen, lower alkyl, phenyl-lower alkylene, hydroxy-lower alkylene, hydroxyphenyl-lower alkylene, amino-lower alkylene, guanidino-lower alkylene or carbamoyl-lower alkylene;

R_2 is hydrogen or lower alkyl;

R_3 is phenyl-lower alkylene;

R_4 is hydroxy or lower alkoxy; and

n is 1 or 2.

4,105,790

α-MINO KETONE DERIVATIVES

Clifford Ronald Hughes; Stephen John Jackson; John Preston, and Peter Leslie Walton, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 9, 1976, Ser. No. 740,195
Claims priority, application United Kingdom, Nov. 25, 1975, 48402/75
Int. Cl.² A61K *31/24;* C07C *101/04*
U.S. Cl. 424—309 **7 Claims**

1. An α-aminoketone derivative of the formula:

$$R^1NH.CHR^2.CO.Ar.X.A.CO.R^3 \qquad I$$

wherein R^1 is hydrogen; R^2 is hydrogen; R^3 is a hydroxy or C_{1-8}-alkoxy radical; and wherein Ar is a p-phenylene radical; X is oxygen; and A is a methylene radical; or a pharmaceutically acceptable acid addition salt or a metal complex thereof of an α-aminoketone derivative of formula I wherein R^1 is hydrogen; or a pharmaceutically-acceptable base addition salt of an α-aminoketone derivative of formula I wherein R^3 is a hydroxy radical.

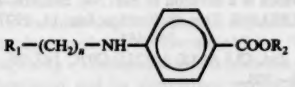
4,105,791

HYPOLIPIDEMIC CYCLOALKYLAMINOBENZOIC ACIDS

Eugene R. Wagner, and Donald P. Matthews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 22, 1976, Ser. No. 668,887
Int. Cl.² A61K *31/245;* C07C *101/60, 101/62*
U.S. Cl. 424—310 **30 Claims**

1. A compound of the formula



wherein

R_1 is a monocyclic cycloalkyl radical having from 7 to 10 carbon atoms or a polycyclic cycloalkyl radical selected from the group consisting of octahydromethanoindenyl and tricyclooctanyl,

n is an integer of from 0 to 4, and

R_2 is a lower alkyl group of from one to about three carbon atoms or hydrogen and further including the pharmaceutically-acceptable salts thereof.

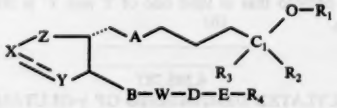
4,105,792

PROSTANE DERVATIVES

Werner Skuballa; Bernd Radüchel; Helmut Vorbrüggen; Walter Elger; Olaf Loge, and Eckehard Schillinger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed May 25, 1976, Ser. No. 689,849
Claims priority, application Fed. Rep. of Germany, May 26, 1975, 2523676; Apr. 12, 1976, 2616304
Int. Cl.² C07C *69/34, 177/00;* A61K *31/225*
U.S. Cl. 424—313 **9 Claims**

1. Prostane derivatives of the formula

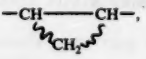


wherein

R_1 is the monovalent acyl radical of a hydrocarbon dicarboxylic acid of up to 15 carbon atoms; R_2 and R_3 each are hydrogen or alkyl of 1–4 carbon atoms;

A is —CH_2—CH_2—, cis—CH=CH— or trans—CH=CH—;

B is —CH_2—CH_2—, trans—CH=CH—, —C≡C— or



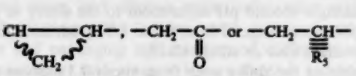
wherein the methylene group is in either the α- or β- position;

W is hydroxymethylene, carbonyl, or

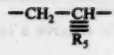
wherein the OH—group is in either the α- or β- position;

D and E together form a covalent bond, or D is a straight-chain or branched alkylene group of 1–5 carbon atoms or a —C≡C—group and E is oxygen, sulfur or a covalent bond;

R_4 is alkyl of 1–10 carbon atoms or cycloalkyl of 4–10 carbon atoms;
Z is carbonyl or hydroxymethylene;
X=Y is



wherein R_5 is lower alkyl or hydroxyl when Z is hydroxymethylene, and X=Y is —CH=CH— or



wherein R_5 is lower alkyl or hydroxyl when Z is carbonyl.

8. A pharmaceutical composition comprising an abortion-inducing amount of a compound according to claim 1 per unit dosage, in admixture with a pharmaceutically acceptable carrier.

9. In a method for inducing abortion in pregnant mammals, the improvement which comprises administering a safe and effective amount of a compound according to claim 1 to a pregnant mammal effective to induce abortion therein.

4,105,793

MULTIFUNCTIONAL ACRYLATES AS FOLIAR FUNGICIDES

Arthur L. Gross, Stockton, Calif., assignor to Celanese Corporation, New York, N.Y.

Filed Jul. 28, 1976, Ser. No. 709,557
Int. Cl.² A01N *9/24*
U.S. Cl. 424—314 **13 Claims**

6. A method for the control of leaf rust of wheat comprising applying to uninfected wheat foliage an effective amount to inhibit the growth of leaf rust of a polyol acrylate ester selected from the group consisting of pentaerythritol tetraacrylate, pentaerythritol triacrylate and trimethylol propane triacrylate.

4,105,794

PROCESS OF MITIGATING CHOLELITHIASIS

William Drell, and John Kingsley Pollard, Jr., both of La Jolla, Calif., assignors to Calbiochem-Behring Corp., La Jolla, Calif.

Filed Aug. 4, 1977, Ser. No. 821,804
Int. Cl.² A61K *31/205, 31/535, 31/495*
U.S. Cl. 424—317 **4 Claims**

1. A method of mitigating cholelithiasis in humans comprising administering a therapeutically effective amount of 3-hydroxy-3-methylglutaric acid or a pharmaceutically acceptable salt thereof.

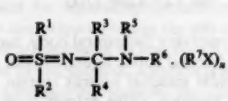
4,105,795

ANTISPASMODIC SUBSTITUTED SULPHOXIMIDES

Manfred Haake, Marburg-Cappel; Reinhold Pothmann, Buergeln; Kurt H. Ahrens, Schwaig, and Edgar Fritschi, Roethenbach, all of Fed. Rep. of Germany, assignors to Ludwig Heumann & Co. GmbH., Nuremburg, Fed. Rep. of Germany

Filed Sep. 2, 1976, Ser. No. 719,970
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1975, 2539220
Int. Cl.² A61K *31/16, 31/40, 31/445, 31/535;* C07C *145/00;* C07D *295/08*
U.S. Cl. 424—320 **54 Claims**

1. Compounds of the general formula I



(I)

wherein
R^1 represents a group selected from the group consisting of straight chain alkyl groups; branched chain alkyl groups; aryl groups; and aryl groups mono- or di- substituted by halogen, trifluoromethyl, alkoxy of 1 to 3 carbon atoms, or alkyl of 1 to 3 carbon atoms;
R^2 represents an alkyl group;
R^3 and R^4 independently represent groups selected from the group consisting of hydrogen; straight chain alkyl groups; branched chain alkyl groups; aryl groups and aryl groups mono- or di- substituted by halogen, trifluoromethyl, alkoxy of 1 to 3 carbon atoms, or alkyl of 1 to 3 carbon atoms;
R^5 and R^6 are alkyl or together with the nitrogen atom form a piperidine, morpholine, or pyrrolidine ring, the group
R^7 represents a group selected from the group consisting of hydrogen; straight chain alkyl groups and branched chain alkyl groups;
X represents an anion of a physiologically acceptable acid and
n represents a number selected from the group consisting of 0 and 1.

50. Method of treating a patient suffering from spasms by administering an antispasmodical'y effective amount of a compound according to claim 1.

4,105,796

PHARMACEUTICAL COMPOSITIONS CONTAINING RACEMIC OR OPTICALLY ACTIVE 1-(2,6-DIMETHYL-PHENOXY)-2-METHYLAMINO-PROPANE AND METHOD OF USE

Herbert Köppe; Werner Kummer; Helmut Stähle; Richard Reichl, all of Ingelheim am Rhein, and Rolf Giesemann, Biberach an der Riss, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed May 19, 1976, Ser. No. 688,105
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1975, 2524363
Int. Cl.² A61K *31/135*
U.S. Cl. 424—330 **2 Claims**

1. An anticonvulsive or antiarrhythmic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective anticonvulsive or antiarrhythmic amount of racemic or optically active 1-(2',6'-dimethylphenoxy)-2-methylamino-propane or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

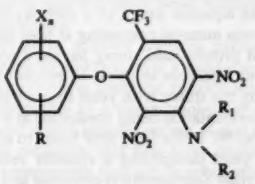
4,105,797

FUNGICIDAL 3-AMINO-6-TRIFLUOROMETHYL-2,4-DINITRODIPHENYLETHERS

Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jun. 14, 1977, Ser. No. 759,258
Int. Cl.² A01N *9/20, 9/24;* C07C *91/16, 91/28*
U.S. Cl. 424—330 **12 Claims**

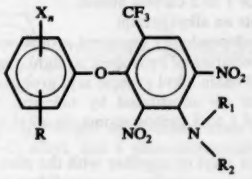
1. A compound of the formula:



where
R is H or lower alkyl,
X is halogen,
n is 0,1,2 or 3, and

R_1 and R_2 are selected from H and lower alkyl.

11. A method of controlling undesired fungi comprising applying thereto a fungicidally effective amount of a compound of the formula:



where

R is H or lower alkyl,

X is halogen,

n is 0, 1, 2 or 3, and

R_1 and R_2 are selected from H and lower alkyl.

4,105,798

PERFLUORO POLYCYCLIC COMPOUNDS FOR USE AS SYNTHETIC BLOOD AND PERFUSION MEDIA

Robert E. Moore, Wilmington, Del., and Leland C. Clark, Jr., Cincinnati, Ohio, assignors to Sun Ventures, Inc., Radnor, Pa. and Children's Hospital Medical Center, Cincinnati, Ohio

Continuation-in-part of Ser. No. 706,315, Jul. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 579,766, May 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 530,791, Dec. 9, 1974, abandoned. This application Aug. 22, 1977, Ser. No. 826,288

Int. Cl.[2] A61K *31/025;* C12B *3/00, 9/00*

U.S. Cl. 424—352 **26 Claims**

1. An artificial blood comprising an emulsion of a non-aromatizable perfluorinated material in water, the amount of water being greater than 40% by volume, said emulsion containing a non-toxic emulsifier and a perfluorinated C_9–C_{18} polycyclic hydrocarbon containing at least two bridgehead carbon atoms linked through a bridge containing at least one carbon atom.

4,105,799

PROCESS FOR THE PRODUCTION OF A CASEIN SUBSTITUTE

Keith L. Chandler, Algonquin; Roy G. Hyldon, Crystal Lake; Surinder Kumar, Buffalo Grove, and John P. O'Mahony, Crystal Lake, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed May 13, 1976, Ser. No. 685,735

The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.

Int. Cl.[2] A23J *3/00;* A23L *1/36*

U.S. Cl. 426—44 **16 Claims**

1. A process for producing a proteinaceous mixture of modified plant protein and unmodified protein, said mixture having thermoplastic and forming properties similar to casein and caseinate salts, said process comprising:

a. making an aqueous slurry of a carbohydrate containing plant protein material containing at least about 30 percent by weight protein, said slurry having a solids content of from about 3 percent to about 18 percent by weight:

b. fermenting the slurry with yeast to generate carbon dioxide, said fermentation being conducted at a temperature of from 33° to 90° F. for from four hours to ninety-six hours, and said yeast comprising a member selected from the group of yeast *Saccharomyces cerevisiae* and *Saccharomyces carlsbergensis;*

c. adding an alkali metal hydroxide or ammonium hydroxide to the slurry in amount sufficient to form a carbonate and to make a first pH adjustment of the carbonate containing slurry to a pH within the range from of about 7.0 to about 10.5;

d. heating the aqueous slurry to react the carbonate with the protein;

e. making a second pH adjustment to the slurry to produce a pH in the range of from 6.0 to 8.0 by addition thereto of an edible acid or edible alkali;

f. admixing the slurry with from about 0.3 percent to about 2.0 percent by weight peroxide per pound of protein in the slurry;

g. heating the slurry to a temperature within the range of from 60° to 150° F. under a vacuum to remove steam volatile flavor substances;

h. drying the slurry to remove a substantial portion of the water therein; and

i. admixing from 1 to 15 parts by weight of the dried pH adjusted slurry with from 1 to 30 parts by weight unmodified proteinaceous material.

4,105,800

IMMOBILIZED ENZYME METHOD TO ASSESS FISH QUALITY

Frederick D. Jahns, Peacedale, and Arthur G. Rand, Jr., Kingston, both of R.I., assignors to Board of Regents for Education of the State of Rhode Island, Providence, R.I.

Filed Jul. 26, 1976, Ser. No. 708,618

Int. Cl.[2] G01N *33/12;* A22C *25/00;* C07G *7/02*

U.S. Cl. 426—61 **5 Claims**

1. An article of manufacture of assessing the quality of fish comprising an elongated support supporting two carriers, one carrier being impregnated with a freeze dried mixture consisting essentially of resazurin, xanthine oxidase, a stabilizer for xanthine oxidase, and a buffer and the other carrier being impregnated with a freeze dried mixture consisting essentially of resazurin, diamine oxidase, a stabilizer for diamine oxidase and a buffer.

4,105,801

COATED EDIBLE PRODUCT AND PROCESS FOR MAKING SAME

Amilcare Dogliotti, Neive (Cuneo), Italy, assignor to P. Ferrero & C. S.p.A., Alba (Cuneo), Italy

Filed Feb. 18, 1977, Ser. No. 770,146

Claims priority, application Italy, Mar. 5, 1976, 67534 A/76

Int. Cl.[2] A23G *3/00*

U.S. Cl. 426—99 **24 Claims**

1. A dragee comprising a core and shell of edible material enveloping the core and adhering to the latter, wherein the shell is formed by an intimate mixture of microcrystals of xylitol with a normally solid fatty substance selected from the group consisting of mono-, di- and triglycerides of palmitic-, stearic- and oleic acids and cocoa butter, in a proportion of 0.5 to 15 parts by weight of the fatty substance to each 100 parts by weight of xylitol.

4,105,802

PROCESS FOR PRODUCING CARBONATED COFFEE DRINK

Kichinosuke Cho, Funabashi, and Tsutomu Watanabe, Tokyo, both of Japan, assignors to Kabushiki Kaisha Art Coffee, Tokyo, Japan

Continuation of Ser. No. 661,115, Feb. 25, 1976, abandoned, which is a continuation of Ser. No. 506,689, Sep. 17, 1974, abandoned. This application Jan. 14, 1977, Ser. No. 759,489

Claims priority, application Japan, Sep. 20, 1973, 48-126086

Int. Cl.[2] A23F *1/00*

U.S. Cl. 426—329 **8 Claims**

1. A process for preserving the natural body, taste and flavor of packaged freshly brewed coffee liquid without removing or degrading the colloidal material present therein which comprises preparing an aqueous coffee extract from roasted and ground coffee beans, adding to and dispersing in said coffee

extract an effective amount of a propylene glycol fatty acid ester as an anti-foaming agent or a mixture of said propylene glycol fatty acid ester and a second anti-foaming agent selected from the group consisting of glycerin fatty acid esters, sorbitan fatty acid esters, and silicone resin; carbonating said coffee extract by impregnating the same with carbon dioxide under pressure and packaging said carbonated coffee extract in a sealed container; said amount being effective to reduce the foaming when said container is opened.

4,105,803

SOYBEAN-CHEESE WHEY FOOD PRODUCT

Andrew C. Peng, Columbus, Ohio, assignor to Ohio Agricultural Research and Development Center, Wooster, Ohio

Filed May 2, 1977, Ser. No. 793,048
Int. Cl.[2] A23C *21/00*; A23J *1/14, 1/20*
U.S. Cl. 426—583 19 Claims

1. A method for producing a bland nutritional food product from soybeans and sweet cheese whey consisting essentially of the steps of:

comminuting soybeans in the presence of water to provide an aqueous dispersion thereof in water exhibiting a soybean material weight to water volume ratio selected between about 0.05 and 0.15;

heating said aqueous dispersion at a temperature and over an interval selected for deactivating trypsin inhibitor;

filtering said aqueous dispersion to remove non-suspended particulate matter;

providing an aqueous dispersion of proteinaceous sweet cheese whey material in water exhibiting a whey material weight-to-water volume ratio selected between about 0.05 and 0.15;

mixing said sweet cheese whey aqueous dispersion with said soybean aqueous dispersion following said trypsin inhibitor deactivation in about 1:1 ratio to provide an aqueous soybean-cheese whey mixture;

heating said aqueous mixture to a temperature less than about 110° C; and

precipitating a soybean-whey curd from said aqueous mixture by the addition thereto of a precipitant including as its principal ingredient, glucono-delta-lactone.

4,105,804

METHOD FOR SEPARATION OF BACTERIA CELLS FROM CULTURE BROTH

Gyozo Terui, 8-26, Tanabe-Nishinocho, Higashisumiyoshi-ku, Osaka; Nobuo Takada, Neyagawa, and Shuzo Sawada, Tokyo, all of Japan, assignors to Gyozo Terui, Osaka, Japan

Continuation-in-part of Ser. No. 544,649, Jan. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 437,726, Jan. 30, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,528
Claims priority, application Japan, Jan. 31, 1973, 48/13116
Int. Cl.[2] A23J *1/00*
U.S. Cl. 426—656 6 Claims

1. A method for separating bacteria cells from a culture broth, which comprises adjusting the pH of said culture broth in the form of a suspension to less than 6 and adding thereto, before or after pH adjustment, a sufficient amount of a solution of casein or alkali-soluble soybean proteins to precipitate the bacteria cells.

4,105,805

FORMATION OF METAL NITRIDE OXIDE SEMICONDUCTOR (MNOS) BY ION IMPLANTATION OF OXYGEN THROUGH A SILICON NITRIDE LAYER

William Bernard Glendinning, Red Bank, and Albert Mark, Toms River, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 29, 1976, Ser. No. 757,550
Int. Cl.[2] B05D *3/06, 5/12*
U.S. Cl. 427—38 18 Claims

1. Method of treating a silicon substrate including the steps of

(A) placing the silicon substrate in a reaction chamber and then purging the chamber with an inert gas to remove oxygen and water vapor;

(B) etching the top surface of the substrate with hydrogen chloride gas to remove impurities and other contaminants from the silicon surface;

(C) depositing a layer of silicon nitride of about 300 to 700 angstroms in thickness on the top surface of the silicon substrate;

(D) forming a mask provided with windows representing device structures over the silicon nitride layer;

(E) implanting oxygen through the window portion of the silicon nitride layer into the silicon nitride/silicon interface region at room temperature for about 30 minutes and at an accelerating potential of 30 to 60 kv to obtain a concentration of 2 to 5 (10^{16}) oxygen atoms per square centimeter at the silicon nitride silicon interface during the oxygen implantation to form a tunneling insulator interface layer of silicon dioxide;

(F) removing the mask from the silicon nitride; and

(G) annealing the oxygen implanted silicon in a flowing atmosphere of nitrogen at about 1000° C. for about 30 minutes to obtain the structure silicon nitride/silicon dioxide/silicon.

4,105,806

PHOTOINITIATOR FREE INKS AND METHOD

William R. Watt, Princeton Junction, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Nov. 19, 1976, Ser. No. 743,132
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—44 20 Claims

1. A method for producing a multilayer coating which comprises:

1. applying as a first layer to a substrate a composition comprising at least one epoxide or acrylic material that is normally radiation-curable in the presence of a photoinitiator which releases an active catalyst effective to initiate curing of said material upon exposure to radiation, the composition in said first layer being substantially free of said photoinitiators;

2. without drying or actively effecting curing of said first layer, applying to said first layer a radiation-curable composition comprising at least one epoxide material cationically polymerizable to a higher molecular weight and a photoinitiator which initiates curing of said material upon exposure to radiation; said first layer composition being devoid of components that act to substantially inhibit or retard the action of the photoinitiator in said second layer; and

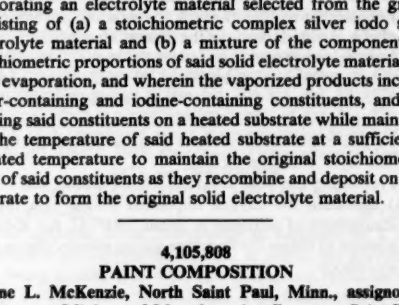
3. exposing the coated substrate to irradiation to produce a hardened, multilayered coated substrate.

4,105,807

PRODUCTION OF THIN, STABLE, SOLID ELECTROLYTE FILMS OF HIGH IONIC CONDUCTIVITY

Mulk Raj Arora, Kirkland, Canada, assignor to Unican Electrochemical Products Ltd., Montreal, Canada

Filed Jul. 28, 1975, Ser. No. 599,897
Int. Cl.[2] C23C *15/00, 11/08*
U.S. Cl. 427—126 **22 Claims**



1. A process for depositing thin films of complex silver iodo solid electrolytes on a substrate, said electrolytes having good ionic conductivity at room temperature, which comprises evaporating an electrolyte material selected from the group consisting of (a) a stoichiometric complex silver iodo solid electrolyte material and (b) a mixture of the components in stoichiometric proportions of said solid electrolyte material, by flash evaporation, and wherein the vaporized products include silver-containing and iodine-containing constituents, and depositing said constituents on a heated substrate while maintaining the temperature of said heated substrate at a sufficiently elevated temperature to maintain the original stoichiometric ratio of said constituents as they recombine and deposit on said substrate to form the original solid electrolyte material.

4,105,808

PAINT COMPOSITION

Eugene L. McKenzie, North Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 188,448, Oct. 12, 1971, abandoned, which is a continuation of Ser. No. 547,450, May 4, 1966, abandoned. This application Jun. 11, 1976, Ser. No. 695,053
Int. Cl.[2] C08L *77/08;* **C09D** *5/00*
U.S. Cl. 427—137 **13 Claims**

9. A method for forming a paint marking on a roadway that bears traffic rapidly after application comprising

(I) heating in a closed system to a predetermined elevated temperature that is above the range of normal ambient temperatures of 40° F to 110° F but is less than 500° F a paint composition that comprises

(A) in mixture as two phases

(1) a paint vehicle that includes a nonvolatile organic film-forming paint binder and that

(a) is a liquid at said normal ambient temperatures, but

(b) forms a durable adherent unified tough non-tacky paint film when applied as a thin coating and exposed to said normal ambient temperatures and

(2) a film-forming thermoplastic substantially neutral polyamide reaction product of a polymerized fatty acid and a polyamine mixed in said paint vehicle and accounting for at least about 5 weight-percent of the nonvolatile organic ingredients of the paint composition, which polyamide

(a) is a solid at said normal ambient temperatures,

(b) is insoluble in the paint vehicle at said normal ambient temperatures,

(c) dissolves in said paint vehicle at said predetermined elevated temperature to form a sprayable solution having a viscosity of less than 5000 centipoises, and

(d) forms, in combination with said paint vehicle, a firm nontacky adherent film rapidly after said solution of the two is applied at said elevated temperature as a thin coating to a substrate that is a a said normal ambient temperature; and

(B) pigments in an amount sufficient to color the paint composition; and

(II) coating the paint composition on the roadway while it is at said elevated temperature.

4,105,809

PROCESS FOR DEMISTING TRANSPARENT MATERIALS

Toshiaki Ohno, Fussa, and Kiyoshi Niizeki, Itsukaichimachi, both of Japan, assignors to Hoya Lens Corporation, Tokyo, Japan

Filed Apr. 4, 1977, Ser. No. 784,270
Int. Cl.[2] C03C *17/32;* **B05D** *7/04, 1/36*
U.S. Cl. 427—164 **16 Claims**

1. A process for demisting a transparent material comprising the steps of:

(1) coating onto a surface of the transparent material a copolymer obtained by subjecting 2-hydroxyethyl methacrylate to solution polymerization;

(2) graft-copolymerizing an allyl alcohol tribasic acid ester onto the coating; and

(3) curing the resulting grafted copolymer by heating.

4,105,810

CHEMICAL VAPOR DEPOSITION METHODS OF DEPOSITING ZINC BORO-SILICATED GLASSES

Takeo Yamazaki; Yoko Wakui, both of Hitachi, and Tetuo Kosugi, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 3, 1976, Ser. No. 692,369
Claims priority, application Japan, Jun. 6, 1975, 50/67559
Int. Cl.[2] C23C *11/08*
U.S. Cl. 427—248 C **14 Claims**

1. A method of producing a zinc borosilicate glass through chemical vapor deposition comprising allowing dinenyl an alkyl or alkenyl compound of zinc in liquid phase at room temperature, at least one organic compound of boron selected from the group consisting of alkyl and alkoxyl compounds of boron and at least one compound of silicon selected from the group consisting of alkyl and alkoxyl compounds of silicon in liquid phase at room temperature to react in an oxidizing at at a temperature of 300° to 700° C in the presence of a substrate, thereby depositing a zinc borosilicate glass on the substrate.

4,105,811

METHOD OF PROTECTIVELY COATING METALLIC ALUMINUM CONTAINING SUBSTRATE

Carl Horowitz; Michael Dichter, both of Brooklyn, and Duryodhan Mangaraj, Staten Island, all of N.Y., assignors to Poly-Gulf Associates, New York, N.Y.

Filed Feb. 7, 1975, Ser. No. 547,819
Int. Cl.[2] B05D *3/02, 3/10*
U.S. Cl. 427—302 **9 Claims**

1. The method of applying a protective coating to a metallic aluminum containing substrate comprising the steps of:

A. cleaning the substrate;

B. grafting one or more polymerizable and crosslinkable monomers and prepolymers from a solution onto said substrate in the presence of

1. a small but effective amount of silver ion as an initiator for in situ graft polymerization of said monomers and prepolymers,

2. and a peroxide type catalyst,

said monomers and prepolymers being selected from the group consisting of polyfunctional

vinyl monomers; epoxy compositions selected from the group consisting of aliphatic, cycloaliphatic and aromatic epoxy prepolymers having more than one epoxy group per molecule and a curing and cross-

linking agent for each epoxy prepolymer; and polyurethane prepolymers;

C. and then polymerizing and curing said monomers and prepolymers on said substrate to cross link said components to provide a protective coating bonded to the aluminum containing substrate.

4,105,812

SURFACE FINISH FOR STATUARY

E. Calvin Campbell, Jr., 261 - 17th St., West Babylon, Long Island, N.Y. 11704

Filed Feb. 14, 1977, Ser. No. 768,405
Int. Cl.[2] B44C *3/06*
U.S. Cl. 428—15 13 Claims

1. In combination, a decorative article and a means forming a surface finish therefor, said combination comprising:

(a) a decorative article body having an outer surface and a thin wall constructed of a ferrous metal;

(b) a plurality of brass nodules in brazed engagement with selected, generally randomly located portions of said outer surface in a dispersed and irregular manner and forming a rough finished exterior surface of variegated coloration; said selected portions collectively defining a first area of said outer surface, and the remainder of said outer surface defining a second area thereof; and

(c) a plurality of scorched outer surface regions disposed in an irregular manner upon said second area and generally randomly associated with marginal portions of said nodules and presenting a relatively smooth exterior surface of variegated coloration; said first and second areas cooperatively presenting a complex, irregular blend of multi-variegated coloration, finish and depth over a substantial extent.

4,105,813

TREATMENT OF FABRICS IN MACHINE DRYERS

William G. Mizuno, St. Paul, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 526,697, Nov. 25, 1974, abandoned, which is a division of Ser. No. 254,054, May 17, 1972, Pat. No. 3,870,145. This application Jun. 24, 1976, Ser. No. 699,611
The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.
Int. Cl.[2] B32B *5/18;* F26B *3/00*
U.S. Cl. 428—76 5 Claims

1. An article of manufacture comprising:

a. an impregnated sponge having an average pore size of 0.05 to 4 millimeters which has been impregnated from its surface into its interior with about 0.3 to about 0.7 gram, per cubic centimeter of unimpregnated sponge, of a heat-softenable fabric conditioning agent comprising a quaternary ammonium salt, said fabric conditioning agent having a softening point range of at least 10 Centigrade degrees and being in the softened state in the range of 50° to 90° C., and

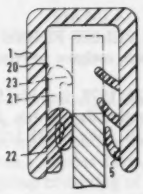
b. a porous material at a surface of said impregnated sponge, said porous material comprising permeable material which is permeable to the fabric conditioning agent under the conditions of use; said permeable material being selected and arranged to release said agent from the impregnated sponge to a surface of the porous material when the fabric conditioner is softened by the heat of the dryer; said permeable material being also selected and arranged to permit said impregnated sponge to act as a reservoir for said agent, releasing a minor amount of said agent in each of at least about 10 drying cycles of said machine dryer.

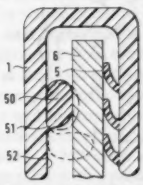
4,105,814

PROFILE STRIP OF U-SHAPED CROSS-SECTION, IN PARTICULAR AN EDGE PROTECTION STRIP FOR AUTOMOBILE

Frank Eggert, Hamburg, Fed. Rep. of Germany, assignor to Schlegel GmbH, Hamburg, Fed. Rep. of Germany

Filed Mar. 24, 1977, Ser. No. 780,919
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631568; Mar. 27, 1976, 2613193
Int. Cl.[2] B32B *3/02;* E04C *2/38*
U.S. Cl. 428—122 15 Claims





1. A profile strip of U-shaped cross-section having two spaced apart arms and a base connecting said arms, said arms and said base together defining a chamber for receiving a flange through the mouth of said chamber;

an adhesion element on at least one of said arms, said adhesion element being held against the flange when the profile strip is mounted thereon;

a support surface connected to said at least one of said arms having said adhesion element, said support surface arranged to cooperate with said adhesion element to exert

increasing pressure on the flange during removal of the profile strip from the flange wherein (1) said adhesion element is designed to roll on said support surface, and (2) the cross-sectional shapes of said support surface and said adhesion element are such that during rolling movement of said adhesion element towards said mouth of said chamber said adhesion element tends to describe a path approaching the arm opposite said at least one of said arms.

4,105,815

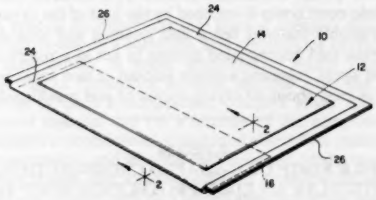
FLAT BATTERY WITH ELECTRODES IN SLURRY FORM

Sheldon A. Buckler, Lincoln, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 495,681, Aug. 8, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,871

Int. Cl.² H01M 6/46

U.S. Cl. 429—152 **23 Claims**



1. A thin flat laminar battery comprising series connected Leclanche cells in each of which cells there is a zinc anode and a cathode, said cathode comprising a slurry dispersion of MnO_2 and carbon in an electrolyte solution containing zinc chloride, ammonium chloride and from about 23 to about 30 percent of water, based on the weight of dispersion, said dispersion containing a polymeric dispersing agent.

4,105,816

DECORATIVE RELIEF FINISH PROCESS

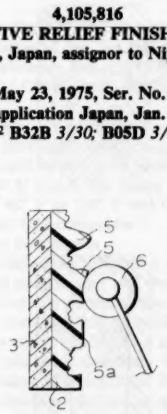
Kiyoshi Hori, Suita, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan

Filed May 23, 1975, Ser. No. 580,342

Claims priority, application Japan, Jan. 17, 1975, 50-8145

Int. Cl.² B32B 3/30; B05D 3/12, 5/02

U.S. Cl. 428—159 **29 Claims**



1. A process of making a decorative relief finish, said process comprising:

forming on the surface of an object on which a decorative relief finish is to be formed a partially hardened layer of coating material having an uneven surface with a plurality of projections of different heights;

providing a pressing roll having a surface which is made of a material which is resinous, has a continuous pore structure, is at least semi-hard, and has the properties of water absorption and water retention;

impregnating said pressing roll with a liquid which is capable of being evenly distributed through the pores of said roller material, which will not damage said roller material, and which has an affinity to said coating material; and

pressing and rolling said pressing roll, while impregnated with said liquid, against the top portions of those of said projections above a predetermined height, thereby flattening said projections to said height, the remainder of said projections below said given height being left unflattened, thus forming a decorative relief finish having both flattened and roughened areas.

4,105,817

MULTI-CHAMBERED CELLULAR STRUCTURE

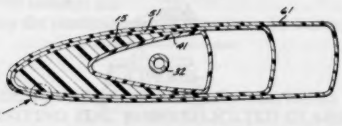
Edmond O. Dunahoo, Long Beach, Calif., assignor to Fiber Science, Inc., Gardena, Calif.

Division of Ser. No. 465,323, Apr. 29, 1974, Pat. No. 3,962,506. This application Jun. 7, 1976, Ser. No. 693,558

The portion of the term of this patent subsequent to Jun. 8, 1993, has been disclaimed.

Int. Cl.² B32B 3/26

U.S. Cl. 428—188 **18 Claims**



1. A fiber-reinforced plastic article of manufacture having a multi-chambered, cellular structure with an outer shell and an inner shell for use as part of a fluid foil structure, said inner shell extending between at least two generally opposite interior walls of said outer shell and being coupled thereto, thereby defining at least two chambers within said article, the wall of each of said shells being composed of a plastic having embedded therein at least one layer of continuous roving of a fibrous reinforcement material, said at least one layer in each of said shells being continuous and unbroken around each of said shells.

4,105,818

GAS BARRIER PACKAGING MATERIAL

William R. Scholle, Corona del Mar, Calif., assignor to Scholle Corporation, Northlake, Ill.

Continuation-in-part of Ser. No. 370,594, Jun. 18, 1973, abandoned. This application Jul. 21, 1975, Ser. No. 597,761

Int. Cl.² B32B 3/02

U.S. Cl. 428—192 **1 Claim**

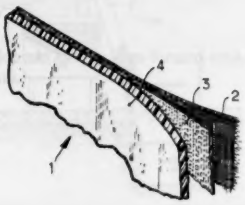
1. A packaging material having improved gas barrier properties consisting of a plurality of separate and distinct, superimposed, contiguous plies of polymer film bonded together around their edges, said plies being formed of the same film and the film being selected from the class of films having a permeability to gases of about 10 or less cc per 100 square inches per mil thickness over a 24 hour period at one atmosphere pressure at 73° F and 50% R.H., said polymer film being selected from the class consisting of polyvinylidene chloride, polyvinylidene chloride and polyethylene film laminates, polyamides, biaxially oriented polypropylene, polyvinyl chloride, vinylidene chloride - vinyl chloride copolymers, polyacrylonitrile, acrylonitrile styrene copolymers, polyesters, and cellophane, said plies each having a thickness of 0.5 to 4.5 mils and together having a permeability to oxygen and carbon dioxide materially less than the permeability of a single ply of the film divided by the number of plies in said material.

4,105,819

LAMINATED SHEETS PARTICULARLY FOR CRYOGENIC ENCLOSURES, PIPES, AND THE LIKE

Michel Kotcharian, Paris, France, assignor to Technigaz, Paris, France

Filed Mar. 1, 1976, Ser. No. 662,414
Claims priority, application France, Mar. 4, 1975, 75 06732; Feb. 20, 1976, 76 04810
Int. Cl.[2] B32B *15/08, 15/14, 15/20;* B65D *25/18*
U.S. Cl. 428—213 15 Claims



1. A laminated sheet material particularly adapted for use in conjunction with a heat-insulating material of a cryogenic enclosure or pipe for receiving a cold fluid such as liquified natural gas, methane, or the like, said laminated sheet material comprising at least three but not more than four layers secured to each other for defining between themselves a pair of interfaces situated respectively between two of said layers and a third, intermediate layer, the latter intermediate layer being in the form of a thin, flexible metal sheet forming a fluid-impervious film, skin, or foil the material of which is selected from the group consisting of aluminum, stainless steel, and Invar, while one of said two layers at one of said interfaces is a flexible glass-fiber fabric while being only thick enough to protect and support said metallic layer and provide a secure connection to a heat-insulating material, the other of said two layers at the other interface being selected from the group consisting of said glass-fiber fabric and a fluid-tight elastomeric material only thick enough to directly contact a cold fluid while protecting said metallic layer, said elastomeric material being selected from the group consisting of a polyurethane elastomer and a silicon elastomer, said intermediate metallic layer being thinner than the other two layers and all three layers together having a total thickness small enough to achieve sufficient flexibility to serve as a primary or secondary sealing barrier in a cryogenic enclosure or as an inner lining or outer wrapping in a cryogenic pipe when used in connection with a heat-insulating material of such an enclosure or pipe, while the other of said two layers also cooperates with said metallic layer and said one glass-fiber fabric layer to afford sufficient resilience and yieldability to transmit forces through said three laminated layers to the heat-insulating material without minimizing the fluid-imperviousness of said metallic layer.

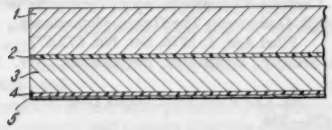
4,105,820

WEATHERPROOF AND MECHANICALLY STABLE LAMINATE FOR ENCASING THERMAL INSULATION

Gerhard Antoni, Mannheim, Germany, assignor to Th. Goldschmidt AG, Essen, Germany

Filed Dec. 8, 1975, Ser. No. 639,001
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1974, 7440815[U]
Int. Cl.[2] B32B *7/02, 15/08*
U.S. Cl. 428—213 2 Claims

1. A laminate which is weatherproof and mechanically stable for encasing thermally insulated objects which comprises in the following order, an outer layer of aluminum sheet having a thickness of about 200 to 800 μ, a first layer of polyethylene film, a layer of a kraft paper, a second layer of polyethylene



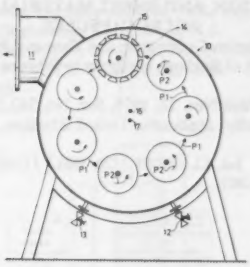
film, and a final sheet of aluminum foil having a thickness of 8 to 20 μ, said layers being bound to the next adjacent layer.

4,105,821

SILICON OXIDE COATED METAL HAVING IMPROVED CORROSION RESISTANCE

Bernhard Blaich, Stuttgart; Ernst Zehender, Ottenbronn, and Karl Kerner, Gerlingen, all of Germany, assignors to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Filed Aug. 5, 1976, Ser. No. 711,842
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1975, 2536013
Int. Cl.[2] B32B *7/02, 15/04*
U.S. Cl. 428—215 13 Claims



1. In the process of producing a protective transparent layer of silicon oxide of a thickness between about 10 and 50 nm by vapor deposition on a metal surface comprising vapor depositing silicon oxide from a gaseous mixture of at least one material selected from the group consisting of silicon and silicon oxide, and oxygen in a vacuum chamber under vacuum conditions, at room temperature the improvement comprising including as a gaseous component of said vacuum chamber, an organosilicon compound having a vapor pressure of at least 10^{-3} mbar at room temperature, said organosilicon compound containing at least one reactive group or atom which can readily react with —OH groups and at least one hydrophobic group to produce a hydrophobic silicon oxide layer between about 10 and 50 nm thick incorporating said hydrophobic groups.

4. A composite article comprising a light reflector comprising a substrate having a reflective metalized layer between about 40 and 200 nm thick with a protective transparent hydrophobic silicon oxide layer between about 10 and 50 nm thick coating said metalized layer, said hydrophobic layer having been formed by vapor deposition of a silicon oxide layer incorporating reaction product hydrophobic groups from a gaseous mixture comprising silicon, oxygen, and an organosilicon compound having formula A_mSiX_{4-m} wherein m is 1, 2 or 3; each X is a reactive group or element selected from the group consisting of —OR, —N(H)R, —N(R)R; —N(R′)C(O)R, and H, wherein R and R′ are each an alkyl containing 1–7 carbon atoms; and each A is a hydrophobic group selected from the group consisting of alkyls, alkenyls and aryls containing from 1 to 7 carbon atoms.

4,105,822

METHOD FOR THE APPLICATION OF A SPECTRAL-SELECTIVE COATING ON A PLATE

Jan De Jong, Rijswijk Z.H., Netherlands, assignor to Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Apr. 1, 1976, Ser. No. 672,677

Claims priority, application Netherlands, Apr. 10, 1975, 7504277

Int. Cl.² F24J *3/02*; B05D *1/02, 1/38*

U.S. Cl. 428—216 **6 Claims**

1. A method for the application of a spectral-selective coating on a metal plate comprising the steps of providing a black enamel layer on the metal plate and subsequently applying a thin layer of a semi-conducting material, the conducting mechanism of which displays a metallic character, on the black enamel layer by spraying indium chloride against the enamel layer at a temperature of the enamel above 500° C. to obtain a layer of indium oxide of a thickness of approximately 0.3 micron.

4,105,823

MICROCAPSULES, METHOD FOR THEIR PREPARATION, AND SHEET MATERIAL CARRYING MICROCAPSULES

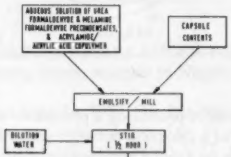
David John Hasler, Caddington, and Thomas Allan McGhee, St. Albans, both of England, assignors to Wiggins Teape Limited, England

Filed Nov. 15, 1976, Ser. No. 742,216

Claims priority, application United Kingdom, Nov. 26, 1975, 48616/75

Int. Cl.² B32B *3/26*; B01J *13/02*

U.S. Cl. 428—307 **23 Claims**



1. A method of encapsulating a finely divided material to produce microcapsules in which the material is surrounded by polymeric shells, comprising the steps of

(a) providing a dispersion of said material in an aqueous medium containing a water soluble urea-formaldehyde precondensate, a water soluble melamine-formaldehyde precondensate, and a water-soluble polymer which is capable of being cross-linked by said precondensates; and

(b) condensing said precondensates by acid catalysis with an acid to achieve cross-linking of said polymer about said material, thereby to form said polymeric shells.

18. The method of claim 1 wherein the aqueous medium is made alkaline after microcapsule formation.

19. A sheet material carrying microcapsules prepared in accordance with claim 18.

4,105,824

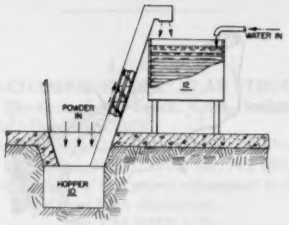
STARCH-DEXTRINE-POLYACRYLAMIDE ADHESIVE AND TAPE

Robert W. Monte, South Merrimack, N.H., assignor to Nashua Corporation, Nashua, N.H.

Continuation-in-part of Ser. No. 607,680, Aug. 25, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,460

Int. Cl.² C09J *7/04*; C08L *3/12*

U.S. Cl. 428—355 **18 Claims**



8. A water activatable adhesive tape suitable to be wound as a roll without premature bonding and without loss of adhesive strength which comprises a paper backing having coated on one surface thereof an adhesive composition comprising:

water, starch, dextrine and a polyacylamide, said starch being a waxy-maze variety of corn starch and containing 95 weight percent amylopectin and having a molecular weight between the range of 20,000 and 50,000 and having a low viscosity such that when dissolved in sufficient water to produce a mixture having a 45% solid content will result in a solution with a viscosity of 12,000 to 16,000 centiposes at 160° F as measured by a Brookfield viscosity, No. 3 spindle at 30 rpm and being present in an amount such that the final dry adhesive will have an amylopectin content between 55 and 75% dry weight, said dextrine having a cold water solubility of at least 90% (77° F) and being employed in amounts such that a final dry adhesive will have a dextrine content between about 15 and 40% dry weight, said polyacrylamide having an "Oswald viscosity" of at least 2.5 centiposes and a "Brookfield viscosity" no greater than 700 Centiposes, said polyacrylamide also having a low degree of hydrolysis in that only 5% or less of the original carboxamide group in the polyacrylamide has been hydrolysized to the carboxylic group, said polyacrylamide being employed in amounts such that the final dry adhesive will have a polyacrylamide content between about 2 and about 6% dry weight.

4,105,825

POLYOLEFIN WITH PHOSPHORYLATED NOVOLAC FLAME RETARDANT, PEROXIDE CURED, AS METALLIC INSULATOR

Darrell Richard Heath, Schofield, Wis.; Fred Frank Holub, Schenectady, N.Y., and Edward Vincent Wilkus, Trumbull, Conn., assignors to General Electric Company, New York, N.Y.

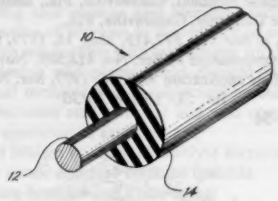
Continuation of Ser. No. 574,188, Feb. 5, 1975, abandoned. This application Jul. 2, 1976, Ser. No. 702,042

Int. Cl.² B32B *15/08*; C08L *23/08*

U.S. Cl. 428—379 **18 Claims**

1. A flame-resistant polyolefin compound comprising the peroxide crosslink cured combination of an ethylene-containing polymer selected from the group consisting of polyethylene, copolymers of ethylene and other polymerizable materi-

als, and blends of such polymers, and phosphorylated novolac phenol-formaldehyde resin, said phosphorylated novolac phe-



nol-formaldehyde resin having been formed with a pentavalent organic phosphate.

4,105,826

HIGH-TEMPERATURE GLASS COMPOSITION

George L. Thomas, Bay Village, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 708,949, Jul. 27, 1976, Pat. No. 4,060,423. This application Jul. 28, 1977, Ser. No. 819,848

Int. Cl.² H01K *1/38*; C03C *3/04*

U.S. Cl. 428—379 **5 Claims**

1. In a glass-to-metal seal between a molybdenum body and a seal glass composition, the improvement wherein the seal glass composition consists essentially of oxides in approximate percent by weight 55–68 SiO_2, 15–18 Al_2O_3, 7–13 CaO and 6–16 BaO, along with minor amounts of incidental impurities, residual fluxes, and refining agents, wherein the weight ratio of Al_2O_3 to combined weight ratio of CaO and BaO is about in the range 0.6:1 to 1:1 so as to reside in the eutectic region of this aluminosilicate system, said glass composition having a liquidus temperature no greater than about 1250° C, a strain point of at least about 725° C, and an average coefficient of linear thermal expansion in the 0–300° C temperature range between about 42×10^{-7} cm/cm/° C to about 48×10^{-7} cm/cm/°C.

4,105,827

PARTICULATE PEROXYGEN COMPOUNDS COATED WITH SODIUM SESQUICARBONATE OR $Na_2SO_4MNa_2CO_3$

Jean Brichard, Vilvoorde; Jean-Claude Colery, and Fernand Meuret, both of Brussels, all of Belgium, assignors to Interox, Brussels, Belgium

Continuation of Ser. No. 461,283, Apr. 15, 1974, abandoned. This application Dec. 17, 1975, Ser. No. 641,634

Claims priority, application Luxembourg, Apr. 20, 1973, 67482; Nov. 19, 1973, 68831

Int. Cl.² C11D *7/38*

U.S. Cl. 428—403 **16 Claims**

1. In a process for stabilizing particulate peroxygen compound selected from alkali metal percarbonates, perpyrophosphates, pertripolyphosphates and peroxymonosulphates by coating said particulate peroxygen compound with a coating agent to provide an hermetic coating, the improvement which comprises using as said coating agent a mixed salt selected from sesquicarbonate having the formula $Na_2CO_3.NaHCO_3.2H_2O$ and mixed compounds obtained by crystallization of sodium sulfate and sodium carbonate of formula $Na_2SO_4.nNa_2CO_3$ where n is a number from 0.3 to 3.

4,105,828

LOW-CURRENT CONTACT CONSTRUCTION

Lothar Borchert, Haar, and Karl-Jörg Stenzel, Söcking, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 27, 1977, Ser. No. 763,104

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1976, 2604291

Int. Cl.² H01H *1/02*; B32B *15/04*

U.S. Cl. 428—665 **16 Claims**

1. A contact structure, more particularly for telecommunications relay contacts, said contact structure consisting of:

(a) a substrate of suitable conducting and/or magnetizable material;

(b) a first layer bonded to said substrate, said first layer composed of a refractory metal selected from the group consisting of rhenium, tungsten, molybdenum and alloys thereof, having a thickness of from 0.02 to 0.08 mm; and

(c) a second layer bonded to said first layer by diffusion annealing, said second layer composed of an alloy consisting of silver and palladium having a 10 to 50% palladium content and a thickness of from 0.005 to 0.2 mm.

4,105,829

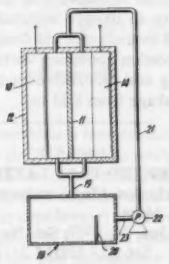
METAL HALOGEN BATTERIES AND METHOD OF OPERATING SAME

Agustin F. Venero, Berkeley Heights, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 7, 1976, Ser. No. 674,583

Int. Cl.² H01M *8/08*, *4/60*

U.S. Cl. 429—15 **14 Claims**



1. An electrochemical cell having a metal bromine couple comprising:

an electrode structure on which to deposit the metal of the metal bromine couple;

an inert counterelectrode structure at which to generate the bromine of the metal bromine couple;

an aqueous electrolyte containing a metal bromide and a bromine complexing agent, the metal of said metal bromide being selected from zinc and cadmium, said bromine complexing agent being selected from water soluble organic quaternary ammonium compounds and mixtures of quaternary ammonium compounds with water soluble organic solvents which in the presence of bromine and at temperatures in the range of about 10° C to about 60° C form a substantially water immiscible liquid;

means for circulating said electrolyte between said electrode structures during charging of the cell;

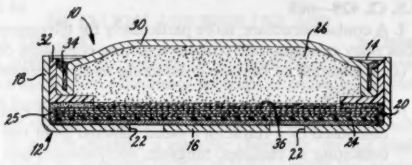
a separation zone communicating with said cell whereby bromine complex formed during charging of the cell is separated from said aqueous electrolyte; and,

means for circulating separated bromine complex from said separation zone to said cell during discharge of said cell.

4,105,830
AIR DEPOLARIZED CELL

Karl Victor Kordesch, Lakewood, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,616
Int. Cl.² H01M 8/00
U.S. Cl. 429—27 13 Claims

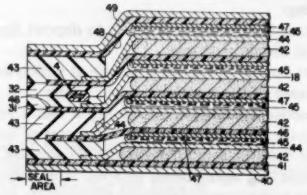


1. An air depolarized cell comprising:
an anode confined within a first container;
a cathode assembly comprising an air cathode having one surface juxtaposed in close relationship to said anode and a nonporous thin film membrane lying adjacent an opposite surface of said air cathode for controlling the flow of oxygen thereto;
separator means disposed between said cathode assembly and said anode;
a second container disposed about said cathode assembly and having at least one air passageway, said air passageway being spaced apart from said nonporous thin film membrane and being of sufficient size to provide said membrane with substantially unrestricted access to the atmosphere;
said nonporous thin film membrane permitting oxygen to pass therethrough exclusively by gas solubility and with its permeability to oxygen selected to correspond to a predetermined average current density for said cell;
an electrolyte solution contained within said cell; and
means for sealing said first and second container to prevent electrolyte leakage from said cell.

4,105,831
VENTED FLAT BATTERY

Paul A. Plasse, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 24, 1977, Ser. No. 761,649
Int. Cl.² H01M 2/12
U.S. Cl. 429—86 5 Claims

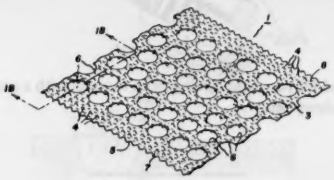


1. In a thin flat laminar battery comprising laminar electrodes, separators and intercell connectors in a gas-permeable central region and means forming a liquid-impermeable seal surrounding said gas-permeable central region, a vent tube extending through said seal into said gas-permeable region, said tube comprising a hydrogen-permeable liquid-impervious tube filled with fiber to form a gas diffusion passage of substantially uniform cross section and having at least one end exposed to the environment outside of said seal and no opening inside said seal.

4,105,832
AN ELECTRO-CHEMICAL BATTERY COMPRISING A PLATE HAVING STIPPLED SUBSTRATE

Raymond Kazimir Sugalski, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 577,419, May 14, 1979, abandoned, which is a continuation of Ser. No. 413,589, Nov. 7, 1973, abandoned. This application Aug. 16, 1977, Ser. No. 825,046
Int. Cl.² H01M 10/30
U.S. Cl. 429—94 5 Claims



1. A nickel-cadmium electrolytic cell comprising:
(a) a casing;
(b) a coil disposed in said casing, said coil comprising:
1. A positive plate and a negative plate, at least one of said plates comprising
a. a thin conductive sheet with opposed major surfaces and having continuous uninterrupted edges,
b. an array of spaced perforations extending through said sheet, intermediate said uninterrupted edges,
c. an array of continuous, relatively smooth, closely spaced bosses in said sheet intermediate said edges and said perforations, each said boss comprised of a projection extending from one of said surfaces, said bosses in said array forming a pattern of alternating projections and recesses in each said surface intermediate said edges and intermediate said perforations, said bosses and said perforation being dimensioned at said surfaces such that the ratio of the cross-sectional dimensions of said perforations to said bosses is substantially greater than 1,
d. a paste comprised of a binder and active material substantially covering said surfaces between said edges and extending through said perforations, and
2. a separator disposed between said positive and negative plates; and
(c) an electrolyte in said casing.

4,105,833
LITHIUM-BROMINE CELL

Wilson Greatbatch, Clarence; Ralph T. Mead, Kenmore; Robert L. McLean, Clarence; Frank W. Rudolph, Depew, and Norbert W. Frenz, North Tonawanda, all of N.Y., assignors to Eleanor & Wilson Greatbatch Foundation, Akron, N.Y.

Filed Sep. 16, 1976, Ser. No. 722,653
Int. Cl.² H01M 4/36
U.S. Cl. 429—104 10 Claims

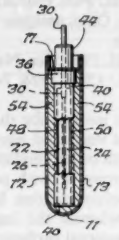
1. A lithium-bromine cell comprising:
(a) a casing of electrically conducting material;
(b) anode means positioned within said casing and comprising a lithium element having an exposed surface portion and another surface portion;
(c) anode electrical conductor means operatively connected to said other surface portion of said lithium element and extending from said casing;
(d) means for sealing said conductor means from the remainder of said cell;
(e) a bromine cathode within said casing and in operative contact with said exposed surface portion of said lithium element and with said casing in a manner such that said casing serves as a cathode current collector;
(f) cathode terminal means on said casing and comprising a

hollow element of electrical conducting material having an internal passage in communication with the interior of said casing and means closing said passage whereby prior to closing said passage said element functions to allow introduction of bromine to the interior of said casing into operative relationship with said lithium anode element and after closing said passage said element functions as an electrical terminal and an electrical potential difference exists between said terminal and said conductor means during operation of said cell; and

(g) a solid lithium bromide electrolyte formed between said lithium anode and said bromine cathode.

8. A lithium-bromine cell comprising:

(a) a casing of electrically conducting material;



(b) anode means positioned within said casing and comprising a lithium element having an exposed surface portion and another surface portion;

(c) electrical conductor means operatively connected to said other surface portion of said lithium element and extending from said casing;

(d) means for sealing said conductor means from the remainder of said cell;

(e) a bromine cathode within said casing and in operative contact with said exposed surface portion of said lithium element and with said casing in a manner such that said casing serves as a cathode current collector; and

(f) a solid lithium bromide electrolyte formed between said lithium anode and said bromine cathode.

4,105,834

ELECTRIC CELLS

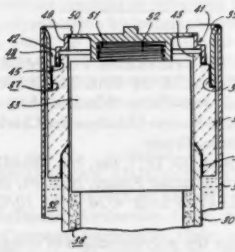
Derrick John Baker, and Roger John Bones, both c/o United Kingdom Atomic Energy Authority, 11 Charles II St., London, England (S.W.1)

Filed Oct. 3, 1977, Ser. No. 839,021

Claims priority, application United Kingdom, Oct. 14, 1976, 42811/76

Int. Cl.² H01M *10/39*

U.S. Cl. 429—104 **8 Claims**



1. An electric cell having an anode, a liquid cathode, and a ceramic solid electrolyte member which defines at least in part on one side thereof a compartment for the liquid anode and on the other side thereof a compartment for the liquid cathode, wherein the improvement comprises,

(a) a ceramic support member joined by a glass seal to the solid electrolyte member so as to support the solid electrolyte member,

(b) a first metallic closure member closing the anode compartment and joined to the ceramic support member by a brazed joint which is resistant to the anode material, and

(c) a second metallic closure member closing the cathode compartment and joined by a glass seal to either the ceramic support member or to the solid electrolyte member, the first and second metallic closure members being electrically insulated from each other.

4,105,835

SOLID-DEPOLARIZER ELECTRIC CELLS

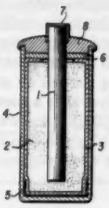
Jacques Guitton, St-Ismier, and Christian Jacques Maurice Charles Alexis Payn, Barbazan, both of France, assignors to ETAT FRANCAIS rep by Del. Min pour l'Armement, France

Continuation of Ser. No. 622,872, Oct. 16, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,607

Claims priority, application France, Oct. 31, 1974, 74 36359

Int. Cl.² H01M *6/04*

U.S. Cl. 429—133 **5 Claims**



1. An electric cell useful in a temperature range of −20° C to +60° C which is perfectly tightly sealed and has a long storage life after which the cell is still operable, comprising: a zinc anode; a solid cathodic depolarizer; a separator between the anode and cathodic depolarizer; and an electrolyte consisting of an aqueous solution of LiCl in a concentration between about 1.5 to 2.5 moles per liter and another material consisting of $Mg(ClO_4)_2$ without $Mg(OH)_2$ present in a concentration between 0.75 and 1.25 moles per liter; wherein said electrolyte does not involve risks of corrosion of the zinc anode as great as the risks in known cells.

4,105,836

HIGH ENERGY DENSITY LITHIUM CELL

Achille L. Almerini, Middletown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 8, 1977, Ser. No. 804,684

Int. Cl.² H01M *6/14*

U.S. Cl. 429—194 **11 Claims**

1. A lithium-organic electrolyte electrochemical cell comprising lithium as the anode, a fluorographite of the formula C_xF wherein x has a value no less than one and no greater than 4.5 as the cathode, and a solution of about 0.5 molar to 1.5 molar of an inorganic lithium salt in a lower alkyl acetate selected from the group consisting of methyl acetate, and propyl acetate as the electrolyte.

4,105,837

CONVERSION OF STEREOREGULAR POLYPROPYLENE TO ATACTIC POLYPROPYLENE

Thomas John Prosser, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 6, 1976, Ser. No. 730,094
Int. Cl.[2] C08F 8/04
U.S. Cl. 526—26 27 Claims

1. A process for treating a polymer of propylene containing stereoregular polypropylene components whereby at least a portion of the stereoregular polypropylene components are converted to the atactic form, said process comprising contacting the polymer with a hydrogenation catalyst at an elevated temperature above 200° C.

4,105,838

METHOD FOR THE POLYMERIZATION OF VINYL CHLORIDE

Hajime Kitamura, and Toshihide Shimizu, both of Joetsu, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Oct. 28, 1975, Ser. No. 626,328
Claims priority, application Japan, Oct. 31, 1974, 49/125976
Int. Cl.[2] C08F 14/06
U.S. Cl. 526—62 20 Claims

1. Method of polymerization of a vinyl chloride monomer or a monomeric mixture composed mainly of vinyl chloride in the presence of a polymerization initiator which comprises placing said mixture into a polymerization vessel fitted with an agitator and other attachments and having inner walls of metal, forming layers of a metal complex with a polar organic compound or an organic dye on the inner walls of the polymerization vessel and the surfaces of the agitator and other attachments coming into contact with the monomer of monomeric mixture, said metal complex being formed by mixing said polar organic compound or organic dye with a metal compound in a ratio ranging from 100:5 to 100:300 by weight, and said complex being used in the form of a solution in an organic solvent to form said layers, subject to subsequent drying.

4,105,839

METHOD FOR POLYMERIZING ETHYLENICALLY UNSATURATED MONOMERS IN ORDER TO ELIMINATE POLYMER DEPOSITION

Shunichi Koyanagi; Hajime Kitamura; Toshihide Shimizu, and Kenji Fushimi, all of Joetsu, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1976, Ser. No. 713,894
Claims priority, application Japan, Aug. 14, 1975, 50-98784
Int. Cl.[2] C08F 2/16, 2/00
U.S. Cl. 526—62 13 Claims

1. In a method for polymerizing at least one ethylenically unsaturated monomer other than vinyl chloride in a heterogeneous phase, the improvement comprising coating, prior to the introduction of a polymerization mixture into a polymerization reactor, the surface coming into contact with the monomer with a reaction product produced by reacting at least one compound selected from group (A) consisting of aromatic polycyclic hydrocarbons, polyene compounds having more than two double bonds, amine compounds, thiazine compounds, thiazole compounds, sulfides, oxazine compounds, basic quinoneimine dyes, triphenylmethane dyes, diphenylmethane dyes, xanthene dyes, thiazole dyes, phthalocyanine dyes, cyanine dyes, higher aliphatic mercaptans, higher aliphatic thioesters, polysulfides, ethers, and group (B) consisting of quinone compounds, organic sulfonic acids and salts thereof, halogen-substituted aromatic polycyclic compounds, carboxylic acids and salts or anhydrides thereof, organic nitro compounds, organic cyano compounds, esters of phosphoric and polyphosphoric acids and salts thereof, acid azo dyes, acid mordant dyes, direct azo dyes, anthraquinone mordant dyes, acid anthraquinone dyes, anthraquinone vat dyes, naphthoquinone or benzoquinone vat dyes, indigozol or anthrasol dyes, indigo dyes, nitro dyes, nitroso dyes, sulfide dyes, acid triphenylmethane dyes, acid quinonemine dyes, oil-soluble azo dyes, oil-soluble xanthene dyes, reactive dyes, and quinoline dyes, with a compound selected from group (C) consisting of aromatic nitro compounds, p-benzoquinone and substituted benzoquinone compounds, organic peroxides, inorganic peroxides, halogeno-oxoacid salts, persulfates, permanganates, nitrates, amine compounds, sulfur-containing organic compounds, reducing carbohydrates, aldehydes, ethers, phenolic compounds, inorganic sulfides, nitrites, phosphites, sulfites, hydrides, hydrazine, ammonia, metal hydroxides, and basic metal salts, at a temperature of between about 50° C and 100° C for more than 10 minutes.

4,105,840

INTERNALLY COATED REACTION VESSEL FOR USE IN OLEFINIC POLYMERIZATION

Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 20, 1977, Ser. No. 807,957
Int. Cl.[2] C08F 2/18, 14/06
U.S. Cl. 526—62 11 Claims

1. In a polymerization method for the production of polymers and copolymers of vinyl and vinylidene halides, when polymerized alone or with other vinylidene monomers having a terminal $CH_2{=}C<$ group or with polymerizable polyolefinic monomers, said polymerization being conducted in a polymerization vessel, wherein the improvement comprises the steps of coating the internal surfaces of said vessel prior to polymerization with an aqueous solution containing 0.03 to about 5% by weight tannin, said tannin being selected from the group consisting of hydrolyzable tannins, condensed tannins, ammonium tannates and tannins complexed with metal ions and rinsing the coated surface with tap water whereby undesirable polymer build up is reduced.

4,105,841

TREATMENT OF INTERIOR SURFACES OF POLYMERIZATION REACTORS TO RETARD POLYMER BUILDUP

William J. Settineri, Midland, and Milton C. Tolly, Hope, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 684,225, May 7, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 773,090
Int. Cl.[2] C08F 10/00
U.S. Cl. 526—62 5 Claims

1. In a process for retarding undesirable buildup of polymeric material on the internal surfaces of reactors used in the polymerization of substantially water-insoluble ethylenically unsaturated monomer the steps comprising, (1) precoating said internal surfaces with an adherent, substantially water-insoluble polymeric coating, then (2) introducing sulfur trioxide into the precoated reactor prior to addition of the polymerization ingredients in an amount suffficient to provide at least about 0.045 gram of sulfur trioxide per gallon of reactor volume, then (3) flushing said reactor with water.

4,105,842

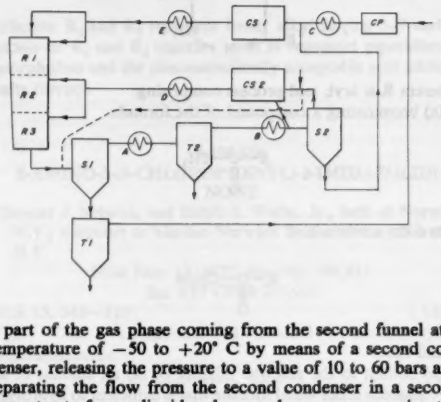
HIGH PRESSURE ETHYLENE POLYMERIZATION USING CATALYSTS OF THE ZIEGLER TYPE

Adrien Nicco, and Jean-Pierre Machon, both of Bethune, France, assignors to Societe Chimique des Charbonnages-CdF Chimie, Mazingarbe, France

Filed Mar. 23, 1977, Ser. No. 780,452
Claims priority, application France, Mar. 31, 1976, 76 09353
Int. Cl.[2] C08F 2/02, 4/34, 4/64, 10/02
U.S. Cl. 526—65 12 Claims

1. In a process for the polymerisation of a reaction mixture comprising ethylene, in the presence of hydrogen, at a temperature of 180° to 340° C under a pressure of 1,000 to 2,500 bars in the presence of a catalyst in at least one stirred reactor comprising at least one first reaction zone and at least one

second reaction zone, which process comprises releasing the pressure and passing the reaction mixture to a first separator under a pressure of 80 to 400 bars to form a gas phase and a liquid phase, passing the liquid phase coming from the first separator to a first funnel under a pressure of 1 to 15 bars to form a polymer and a gas phase, recovering the polymer coming from the first funnel, and recompressing the gas phase coming from the first funnel and passing it to the first reaction zone, the improvement comprising passing the gas phase coming from the first separator to a second funnel via a first condenser to form a liquid phase and a gas phase, recovering the liquid phase from the second funnel, partially liquifying at least



a part of the gas phase coming from the second funnel at a temperature of −50 to +20° C by means of a second condenser, releasing the pressure to a value of 10 to 60 bars and separating the flow from the second condenser in a second separator to form a liquid and a gas phase, recompressing the gas phase coming from the second separator and passing the recompressed gas phase from the second separator to the second reaction zone, mixing the liquid phase coming from the second separator with the gas phase coming from the first funnel, recompressing said mixture of liquid phase and gas phase, and passing said recompressed mixture to the first reaction zone.

4,105,843

PROCESS FOR PRODUCING HYDROCARBON RESINS HAVING IMPROVED COLOR AND THERMAL STABILITY BY HEAT TREATMENT WITH AN α,β-UNSATURATED ANHYDRIDE

Yoshiyuki Iwase; Shigeru Katayama, both of Iwakuni, and Takayuki Nakano, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Apr. 11, 1977, Ser. No. 786,243

Claims priority, application Japan, Apr. 15, 1976, 51-41874; Dec. 15, 1976, 51-149829

Int. Cl.² C08F *24/00, 4/14, 20/08*

U.S. Cl. 526—77 **16 Claims**

1. A process for producing a hydrocarbon resin having improved color and thermal stability, which comprises heat-treating a petroleum cracking or reforming fraction containing cationically polymerizable hydrocarbons and having a boiling range of from 140° C to 280° C, with an α,β-unsaturated dicarboxylic acid anhydride at a temperature of from 50° C to 250° C, and polymerizing said heat-treated petroleum fraction in the presence of a polymerization catalyst.

4,105,844

CYCLOHEPTATRIENE ADJUVANT FOR CHROMIUM OXIDE CATALYST

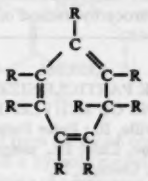
Max Paul McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 31, 1977, Ser. No. 829,369

Int. Cl.² C08F *4/24, 10/00, 10/02*

U.S. Cl. 526—106 **9 Claims**

1. A polymerization process which comprises contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule in the presence of a liquid diluent with a catalyst system comprising (1) a calcined support containing chromium in the form of chromium oxide, and (2) a compound of the formula



where R is selected from H and 1 to 6 carbon atom alkyl groups.

4,105,845

COPOLYMERIZATION OF ISOMONOOLEFINS WITH CONJUGATED DIENES

Floyd E. Naylor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 27, 1974, Ser. No. 446,427

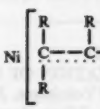
Int. Cl.² C08F *4/80, 4/82, 210/12, 236/04*

U.S. Cl. 526—117 **38 Claims**

1. A polymerization process which comprises polymerizing at least one isomonoolefin and at least one polymerizable conjugated diene under polymerization conditions employing a catalyst system comprising (A) a nickel source complex with (B) a titanium or vanadium compound,

wherein said (A) nickel source complex is represented by

(II)



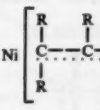
wherein *m* is an integer of 1 or 2, *p* is equal to 2-*m*, X is halogen, and R is hydrogen, or a hydrocarbyl alkyl, cycloalkyl, or cycloalkenyl radical, and wherein two hydrocarbyl R groups can be bound into a carbocyclic ring system containing 3 to 12 ring members, and where other than carbocyclic, said R groups can contain up to 10 carbon atoms per R group with up to a total of 20 carbon atoms per ligand radical,

wherein said (B) titanium or vanadium compound is represented by TiY_4, VY_4, or VOY_3, wherein Y is chlorine, fluorine, bromine, acetylacetonate, or alkoxyl -OR′ in which R′ is a hydrocarbyl radical of 1 to 8 carbon atoms.

13. Copolymers of isomonoolefins and polymerizable conjugated dienes prepared by the process comprising polymerizing at least one said isomonoolefin with at least one said polymerizable conjugated diene under polymerization conditions employing a (A) nickel source complex with (B) a titanium or vanadium compound;

wherein said (A) nickel source complex is represented by

(II)



wherein *m* is an integer of 1 or 2, *p* is equal to 2-*m*, X is halogen, R is hydrogen or a hydrocarbyl alkyl, cycloalkyl, cycloakenyl radical, and wherein two hydrocarbyl R groups can be bound into a carbocyclic ring system containing 3 to 12 ring members, and where other than carbocyclic, said R groups can contain up to 10 carbon atoms

per R group with up to a total of 20 carbon atoms per ligand radical,

wherein said (B) titanium or vanadium compound is represented by TiY_4, VY_4, or VOY_3, wherein Y is chlorine, fluorine, bromine, acetylacetonate, or alkoxyl-OR' in which R' is a hydrocarbyl radical of 1 to 8 carbon atoms.

4,105,846

INCREASING THE PARTICLE SIZE OF AS FORMED POLYETHYLENE OR ETHYLENE COPOLYMER

Glen R. Hoff, Naperville, Ill.; Peter Fotis, Jr., Highland, Ind., and David E. Boone, Lisle, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 25, 1977, Ser. No. 827,566
Int. Cl.² C08F *4/02, 10/02*
U.S. Cl. 526—124 **8 Claims**

1. A process for increasing the particle size of as formed polyethylene or copolymers thereof with up to fifteen mol percent of a C_3 to C_8 olefin comprising:

(a) Mixing $Mg(OR)_2$ and $Ti(OR)_4$, wherein R is an alkyl group containing between one and about six carbon atoms at elevated temperature;

(b) mixing $RAlCl_2$ in the presence of an inert diluent above about −20° C with the product of (a) in at least two stages, the second stage following the first stage after an aging period of at least four hours and any subsequent stage following the previous stage by at least two hours; and

(c) polymerizing ethylene or a mixture of ethylene and said olefin with a polymerization effective amount of the solid part of the product of (b) and an alkylaluminum compound promoter to form said polyethylene or copolymer thereof in particulate form.

4,105,847

METHOD FOR POLYMERIZATION OF ETHYLENE

Akira Ito, and Kenji Iwata, both of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan

Filed Nov. 5, 1975, Ser. No. 629,134
Claims priority, application Japan,
Int. Cl.² C08F *4/02, 10/02*
U.S. Cl. 526—125 **8 Claims**

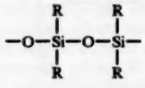
1. A process for polymerizing ethylene which comprises polymerizing or copolymerizing ethylene at a temperature of 20°-300° C. and a pressure of from normal pressure to 200 atm. in the presence of a catalyst consisting essentially of

(A) a co-comminuted composition of the following components:

(a) at least one component selected from the group consisting of titanium tetrachloride and titanium trichloride, said titanium tetrachloride comprising 1-35% by weight and said titanium trichloride comprising 1-80% by weight of component (A);

(b) magnesium dihalide comprising 15-90% by weight of component (A); and

(c) a siloxane polymer selected from the group consisting of an alkylsiloxane polymer, an arylsiloxane polymer and an alkarylsiloxane polymer having the following recurring unit



wherein R represents alkyl containing from 1 to 15 carbon atoms or aryl containing from 6 to 15 carbon atoms, said siloxane polymer comprising 5-50% by weight of component (A); and

(B) an organoaluminum compound.

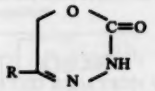
4,105,848

PROCESS FOR THE PRODUCTION OF DIHYDROOXADIAZINONE COMPOUNDS

Robert Bruce Ehlinger, Lenox, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 27, 1976, Ser. No. 754,221
Int. Cl.² C07D *273/04*
U.S. Cl. 544—68 **8 Claims**

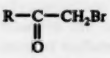
1. A process for the production of a dihydrooxadiazinone compound of the formula



wherein R is aryl; said process comprising:

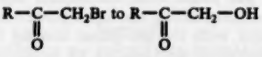
(a) brominating a compound of the formula

to form a mixture of



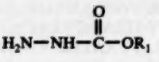
and HBr:

(b) adding to the reaction mixture of (a) an amount of an aqueous alkali metal formate that is sufficient to hydrolyze the

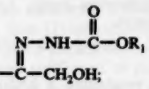


and to neutralize the HBr to formic acid and alkali metal bromide;

(c) adding to the reaction mixture of (b) a carbazate of the formula



wherein R_1 is lower alkyl of 1 to 8 carbon atoms to form a hydrazone compound of the formula



and

(d) cyclizing the hydrazone of step (c) under basic conditions to form the dihydrooxadiazinone compound.

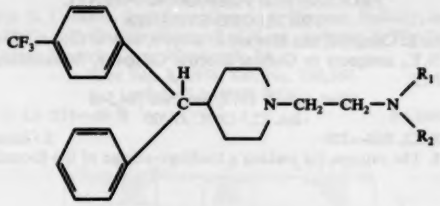
4,105,849

[(SUBSTITUTED)PHENYL]PHENYLMETHYL-1-(DIALKYLAMINOALKYL)PIPERIDINES

Robert W. Hamilton, Wilmette, and Kurt J. Rorig, Glenview, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Sep. 30, 1974, Ser. No. 510,745
Int. Cl.² C07D *413/06, 211/28;* A61K *31/535, 31/445*
U.S. Cl. 544—129 **5 Claims**

1. A compound of the formula



wherein R_1 and R_2 represent lower alkyl having 1–7 carbon atoms or R_1 and R_2 together with N represent piperidino or morpholino and the pharmaceutically acceptable acid addition salts thereof.

4,105,850

1-AMINO-3-(4-CHLOROPHENYL)-2-IMIDAZOLIDINONE

Thomas J. Schwan, and Ralph L. White, Jr., both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed May 13, 1977, Ser. No. 796,611
Int. Cl.² C07D *233/46*
U.S. Cl. 548—319 **1 Claim**

1. The compound 1-Amino-3-(4-chlorophenyl)-2-imidazolidinone.

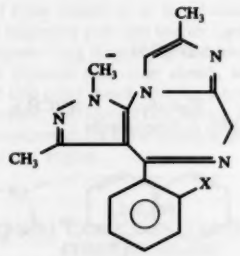
4,105,851

1,3,8-TRIMETHYLIMIDAZOPYRAZOLODIAZEPINE COMPOUNDS

Horace A. De Wald, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Continuation-in-part of Ser. No. 611,042, Sep. 8, 1975, abandoned. This application Jun. 17, 1976, Ser. No. 696,951
Int. Cl.² C07D *487/14*
U.S. Cl. 548—324 **3 Claims**

1. A compound of the formula



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and acid-addition salts thereof; where X is fluorine or chlorine.

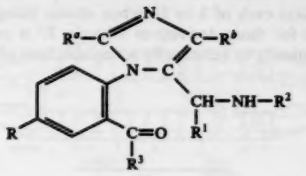
4,105,852

SUBSTITUTED PHENYL KETONES

Cedric Herbert Hassall, Welwyn; William Henry Johnson, Hitchin; Antonin Krohn, London; Carey Ernest Smithen, Welwyn, and William Anthony Thomas, Eaton Ford, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 605,580, Aug. 18, 1975, Pat. No. 4,007,219. This application Nov. 11, 1976, Ser. No. 741,001
Claims priority, application United Kingdom, Aug. 20, 1974, 36567/74; May 21, 1975, 21821/75; Aug. 11, 1975, 36567/75
Int. Cl.² C07D *233/64*
U.S. Cl. 548—342 **4 Claims**

1. A compound of formula



wherein R^a is selected from the group consisting of a hydrogen atom, lower alkyl and a hydroxymethyl group; R^b is selected from the group consisting of a hydrogen atom, lower alkyl and hydroxymethyl; R is selected from the group consisting of a halogen atom, nitro and trifluoromethyl; R^1 is a hydrogen atom or lower alkyl; R^2 is an acyl group formed by removal of the hydroxy moiety from the α-carboxyl group of a naturally occurring amino acid and R^3 is selected from the group consisting of phenyl, halophenyl and 2-pyridyl and pharmaceutically acceptable salts thereof.

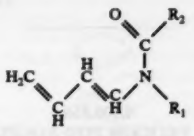
4,105,853

TRANS-N-ACYL-N-ALKYL-1-AMINO-1,3-BUTADIENES, TRANS-N-ACYL-N-ARYL-1-AMINO-1,3-BUTADIENES AND PREPARATION THEREOF

Wolfgang Oppolzer, Thônex, Switzerland, assignor to CHON Corporation, Cambridge, Mass.

Division of Ser. No. 647,049, Jan. 7, 1976, Pat. No. 4,065,496. This application Sep. 21, 1977, Ser. No. 835,325
Int. Cl.² C07C *101/18*
U.S. Cl. 560—24 **3 Claims**

1. A trans-compound of the formula



wherein R_1 is aryl and R_2 is alkoxy or aryloxy, wherein R_1 and R_2 each contain 1 to about 8 carbon atoms.

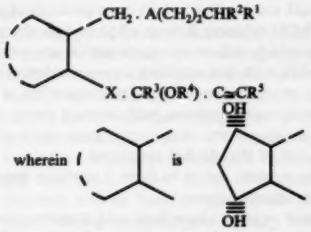
4,105,854

PROSTANOIC ACID DERIVATIVES

Keith Hopkinson Gibson, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 31, 1975, Ser. No. 563,454
Claims priority, application United Kingdom, Apr. 22, 1974, 17497/74
Int. Cl.² C07C *177/00*
U.S. Cl. 560—55 **7 Claims**

1. A prostanoic acid derivative of the formula:



I

R^1 is carboxy or alkoxycarbonyl of 2 to 12 carbon atoms, A is ethylene or vinylene, X is ethylene or trans-vinylene, R^2, R^3 and R^4 which may be the same or different are each hydrogen or alkyl of 1 to 5 carbon atoms and R^5 is phenyl or naphthyl,

which is unsubstituted or is substituted by alkyl, alkoxy or halogenoalkyl each of 1 to 5 carbon atoms, halogen, or hydroxy and for those derivatives wherein R^1 is carboxy the pharmaceutically or veterinarily acceptable base addition salts thereof.

4,105,855

MANUFACTURE OF SYMMETRICAL CAROTENOIDS

Bernhard Schulz, Schwetzingen; Joachim Paust, Neuhofen, and Joachim Schneider, Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 26, 1976, Ser. No. 652,190

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1975, 2505869

Int. Cl.² C07C *3/00, 13/28, 67/00*

U.S. Cl. 560—190 **8 Claims**

1. A process for the manufacture of symmetrical carotenoids from triarylphosphonium salts of the half-molecules of these symmetrical carotenoids, wherein triarylphosphonium salts of the half-molecules are reacted with from 0.8 to 5 times the molar amount of a peroxide, a peroxo compound or a peroxy compound in the presence of a base in water or an aqueous solvent mixture at temperatures of from −50° to +100° C, the half-molecules dimerizing with the formation of a double bond and the elimination of triarylphosphine oxide.

4,105,856

RECOVERY PROCESS FOR AQUEOUS WASTE STREAMS IN ADIPIC ACID SYSTEMS

Cecil A. Newton, Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.

Filed Sep. 29, 1970, Ser. No. 76,624

Int. Cl.² C07C *69/34, 69/42, 69/44*

U.S. Cl. 560—191 **4 Claims**

1. In a process for the treatment of the mother liquor resulting from the nitric acid oxidation of cyclohexanol and/or cyclohexanone and the recovery of valuable components therefrom, which mother liquor is a mixture comprising from about 3 to 10 weight percent succinic acid, from about 8 to 35 weight percent glutaric acid, from about 3 to 6 weight percent adipic acid, from about 6 to 20 weight percent nitric acid, and from about 1 to 3 weight percent vanadium and copper metal catalyst values, the improved process which comprises:

(a) contacting said mother liquor with an organic alcohol of the formula ROH wherein R is an alkyl of 4 to about 20 carbon atoms which will create esters which are substantially immiscible with the resulting aqueous solution and in a sufficient amount to esterify at least a portion of the aliphatic dibasic acids present, said contact being at a temperature ranging from room temperature up to about the boiling point of the alcohol employed;

(b) allowing the organic esters to form a separate organic phase from an aqueous phase;

(c) separating said organic phase from said aqueous phase;

(d) distilling said organic phase to recover the esters of the dibasic acids therefrom, and

(e) concentrating the aqueous phase to recover a concentrated nitric acid solution containing the metallic catalyst values.

4,105,857

PROCESS FOR PREPARING PHENYL TRICHLORO-ETHANES

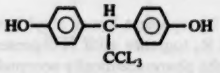
John R. Campbell, and Howard J. Klopfer, both of Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,345

Int. Cl.² C07C *37/00*

U.S. Cl. 568—726 **2 Claims**

1. The process for making a trichloro-ethane of the formula



which comprises reacting under condensation conditions phenol and chloral in a solvent medium consisting essentially of methylene chloride and aqueous sulfuric acid of a concentration of from 90–98%.

4,105,858

QUATERNARY SALTS OF METHACRYLIC OR ACRYLIC ESTERS AND CATIONIC QUATERNARY POLYELECTROLYTES AND ION EXCHANGE RESINS THEREOF

Milan Benes, and Jan Peska, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

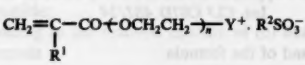
Division of Ser. No. 302,897, Nov. 1, 1972, Pat. No. 4,011,204. This application Jun. 28, 1976, Ser. No. 700,308

Claims priority, application Czechoslovakia, Nov. 2, 1971, 7687-71; Nov. 2, 1971, 7688-71

Int. Cl.² C07C *9/54*

U.S. Cl. 560—222 **5 Claims**

1. Method for producing cationic quaternary salts, based upon methacrylic or acrylic ester and having the general formula II



II

where

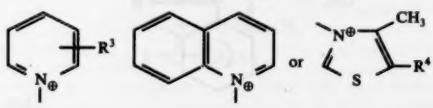
R^1 is H or CH_3

R^2 is CH_3, C_6H_5 or p-$CH_3C_6H_4$

n is 1 or 2

and

Y^+ is either aliphatic, $-N^+(CH_3)_3$ or $-N^+(CH_3)_2CH_2CH_2OH$, or heterocyclic



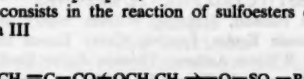
where

R^3 is H, CH_3, $CONH_2$, CHO, $COCH_3$

and

R^4 is H or CH_2CH_2OH,

which consists in the reaction of sulfoesters of the general formula III



III

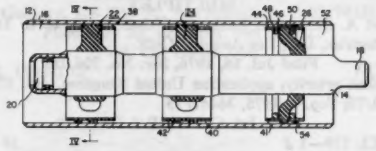
where R^1, R^2 and n have the same meaning as in the formula II, with the corresponding tertiary amine the molar ration of amine to sulfoester being 1 to 1.3 and the reaction being at a temperature between 25°–90° C for between 1 to 40 hours.

4,105,859

COMPARTMENTALIZED GAS INSULATED TRANSMISSION LINE

Alan H. Cookson, Southboro; George A. Kemeny, Sudbury, and Philip C. Bolin, Northboro, all of Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 3, 1976, Ser. No. 720,330
Int. Cl.² H01B 9/04
U.S. Cl. 174—14 R **8 Claims**



1. A gas insulated transmission line section comprising:
an elongated outer sheath at low potential;
an elongated inner conductor at high potential with respect to said outer sheath disposed within, and spaced apart from, said outer sheath;
an insulating gas disposed within said outer sheath and electrically insulating said inner conductor from said outer sheath;
a support insulator disposed within said outer sheath for insulatably supporting said inner conductor within said outer sheath, said support insulator comprising:
a central portion having a bore therethrough, said inner conductor being disposed within said bore; and
three legs secured to said central portion and extending radially outwardly to said outer sheath, said legs being disposed about said central portion;
a first spacer ring secured to said legs and disposed adjacent said outer sheath, said first spacer ring and said outer sheath forming a low potential region therebetween, said first spacer ring having a plurality of apertures therethrough for the trapping of particles within said low potential region;
a barrier insulator supporting said inner conductor within said outer sheath, said barrier insulator substantially filling in the cross-sectional area between said inner conductor and said outer sheath so as to substantially prevent arc product migration past said barrier insulator; and
a second spacer ring secured to said barrier insulator and disposed adjacent said outer sheath, said second spacer ring and said outer sheath forming a low potential region therebetween, said second ring having a plurality of apertures therethrough for the trapping of particles within said low potential region.

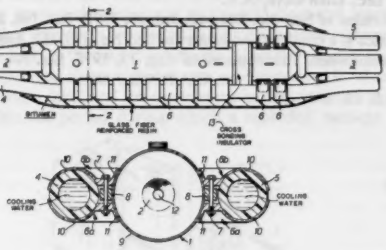
4,105,860

ELECTRICAL CABLE INSTALLATIONS WITH COOLING MEANS

Edmund Hugh Ball, Southampton, England, assignor to Pirelli General Cable Works Ltd., London, England

Filed Nov. 26, 1976, Ser. No. 745,370
Claims priority, application United Kingdom, Dec. 5, 1975, 50072/75
Int. Cl.² H02G 9/02, 15/08; H01B 7/34
U.S. Cl. 174—15 C **8 Claims**

1. An electrical power cable installation including a cable run incorporating at least one accessory (such as a cable joint) subject to increased heating as compared with other parts of the cable run, at least one conduit extending alongside the cable but spaced therefrom throughout the cable run, the conduit serving for the forced passage of coolant to cool the cable run throughout the length thereof by conductive transfer of heat from the cable to coolant in the conduit, and thermally conducting bridging members provided solely between the conduit and the said accessory and maintained in heat transfer relationship therewith for providing preferential access for



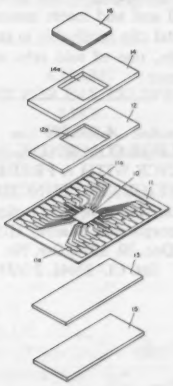
greater conductive transfer of heat from the accessory to the coolant in the conduit than from other parts of the cable run.

4,105,861

HERMETICALLY SEALED CONTAINER FOR SEMICONDUCTOR AND OTHER ELECTRONIC DEVICES

Norman Hascoe, Larchmont, N.Y., assignor to Semi-Alloys, Inc., Mount Vernon, N.Y.

Filed Sep. 29, 1975, Ser. No. 617,494
Int. Cl.² H05K 5/06
U.S. Cl. 174—52 FP **6 Claims**

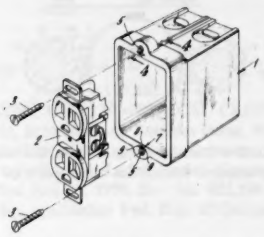


1. An hermetically sealed container for electronic devices comprising:
a supporting pad for an electronic device;
a conductive lead frame surrounding said pad;
a sheet of homogeneous plastic material extending over and fused to each face of said frame and its conductive leads, at least one of said sheets having an aperture dimensioned and disposed to surround said supporting pad and a portion of the adjacent leads of said lead frame;
upper and lower cover plates of material impervious to moisture and air fused to said plastic sheets, one of said plates having an opening in registry with the aperture in the adjacent one of said plastic sheets for receiving an electronic device to be supported on said pad;
and means for hermetically sealing said opening in said one of said plates.

4,105,862
OUTLET BOX HAVING SCREW MOUNTING MEANS

Rudolph H. Hoehn, Queens, N.Y., assignor to Slater Electric Inc., Glen Cove, N.Y.

Division of Ser. No. 384,012, Jul. 30, 1973, Pat. No. 3,955,463, which is a continuation-in-part of Ser. No. 170,052, Aug. 9, 1971, abandoned. This application Aug. 12, 1975, Ser. No. 603,928
Int. Cl.² H02G 3/08
U.S. Cl. 174—53 13 Claims

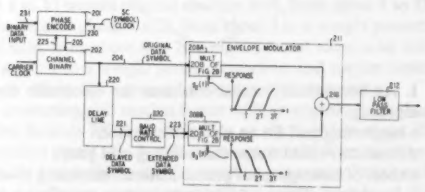


1. An electrical junction box comprising:
a unitary molded plastic enclosure having a bottom and upstanding opposite side and end walls defining an open face at their upper ends; and
boss means on said box at opposite walls for mounting a bracket to said box, said boss means housing quick fastener means for reception of a threaded fastener,
said boss means including a passageway and internal abutment means at said passageway and said quick fastener means comprising insert means in said passageway including means engaging said internal abutment means and means for engaging a threaded fastener,
said passageway including a slot generally parallel to an enclosure wall and said insert means comprising a relatively thin metal clip receivable in said slot having oppositely bent tabs, one of said tabs adapted to engage a threaded fastener.

4,105,863
ARRANGEMENT FOR COMBINING DATA SYMBOLS IN ACCORDANCE WITH A PREDETERMINED WEIGHTING FUNCTION

George John Kustka, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1976, Ser. No. 752,066
Int. Cl.² H04L 27/24
U.S. Cl. 178—67 10 Claims

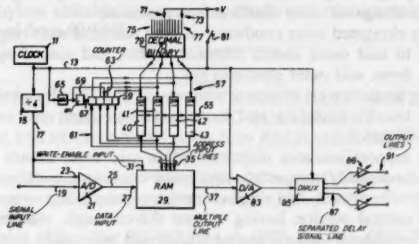


1. In an arrangement for combining original data symbols, a circuit for shaping the amplitude of symbols in accordance witha predetermined weighting function, each data symbol being a signal modulated into one of a plurality of discrete states for a time interval, comprising:
means responsive to the original data symbols for generating extended data symbols;
means for generating segments of the predetermined weighting function;
means for regulating the amplitude of said original data symbols in accordance with one of the generated segments of the predetermined weighting function; and
means for regulating the amplitude of said extended data symbols in accordance with another segment of the predetermined weighting function.

4,105,864
STEREO AND SPACIOUSNESS REVERBERATION SYSTEM USING RANDOM ACCESS MEMORY AND MULTIPLEX

Robert A. Berkovitz, Lexington, Mass., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jul. 16, 1976, Ser. No. 706,011
Claims priority, application United Kingdom, Jul. 17, 1975, 30009/75; Sep. 4, 1975, 36442/75
Int. Cl.² H04R 5/00
U.S. Cl. 179—1 J 14 Claims



1. A sound reproduction arrangement comprising:
(a) a listening area;
(b) at least a first primary loudspeaker located in said listening area and connected to be driven in response to a first audio frequency signal;
(c) input means responsive to said first audio frequency signal to provide input signal data as a function thereof;
(d) signal delay means connected to receive said input signal data and provide a plurality of delayed signals each corresponding to the said input signal data delayed by a respective delay constant, said delay means including means conditioned and arranged to multiply each of the said delayed signals by a respective pre-selected gain constant, a plurality of output channels each supplied with at least a respective one of said delayed signals, addressable data storage means for storing successive sampled values of the said input signal data, control means arranged for response to a periodic clock signal to supply a preselected sequence of address instructions to said data storage means so as to produce successive cycles of record/recall operations in each of which at least a respective one of the said successive sampled values is recorded, and a plurality of stored sampled values which sampled values have each been recorded a respective pre-selected numbers of cycles previously, are recalled sequentially, and a demultiplexer means connected for response to the data output by said data storage means and arranged to assign the recalled values to respectively pre-selected ones of said output channels, whereby in use the said data output by said data storage means comprises a plurality of time division multiplexed components each associated with a respective one of the said pre-selected numbers, the said delayed signals being formed by respective ones of the said components and the said delay constants being related, respectively, with associated ones of said pre-selected numbers; and
(e) a plurality of secondary loudspeakers disposed at respective locations spaced around the perimeter of said listening area and each connected to be driven by a respective one of said output channels, the delay constant and secondary loudspeaker for each of said delayed signals being selected so that the delay and direction of the sound pro-

duced in the listening area in response thereto substantially corresponds to those of a sound corresponding to said first audio frequency signal reflected from the boundary of an enclosure of substantially greater size than that of the listening area, thus obtaining a sensation of spaciousness.

4,105,865

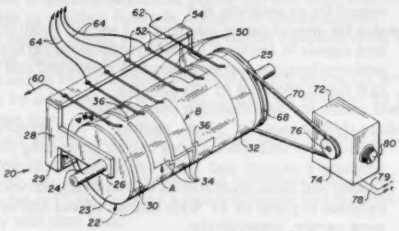
AUDIO DISTRIBUTOR

Henry Guillory, 186 Day St., San Francisco, Calif. 94131

Filed May 20, 1977, Ser. No. 799,071

Int. Cl.[2] H04R *5/00*

U.S. Cl. 179—1 G **7 Claims**



1. A device for sequentially distributing an audio electrical signal to at least a pair of a plurality of sound reproducing elements, comprising:

first circuit means having the audio electrical signal applied thereto;

a number of second circuit means, each second circuit means corresponding to and in electrical communication with one of the plurality of sound reproducing elements, said first and second circuit means being mounted in spaced relation relative to one another;

a pair of substantially non-resistive, electrical conductive elements mounted to a support member and in electrical communication with the first circuit means, each one of the conductive elements defining a first segment and a plurality of second segments, there being at least one of the second segments for each one of the second circuit means, said support member being situated proximate the first and the second circuit means; and

means for cyclically moving the support member to place the conductive elements in electrical communication with the first circuit means and each one of the second circuit means, the plurality of second segments being arranged relative to the second circuit means to establish electrical communication between the first circuit means and at least a pair of the second circuit means at any one moment in time so that the audio electrical signal will be distributed to the pair of the sound reproducing elements in sequential, serial fashion.

4,105,866

TELEPHONE ANSWERING MACHINE BUSY SIGNAL DETECTION DEVICES WITH SWITCHING MEANS

Padraig Anthony Henehan, Bracknell, and Michel George Bazil Farkouh, Camberly, both of England, assignors to Ansafone Limited, London, England

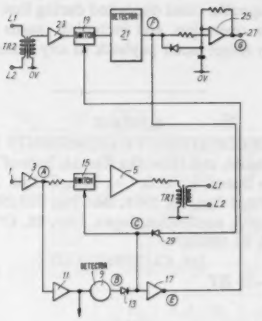
Filed May 24, 1976, Ser. No. 689,466

Claims priority, application United Kingdom, May 28, 1975, 23231/75

Int. Cl.[2] H04M *1/64*

U.S. Cl. 179—6 R **3 Claims**

1. A device for causing an interruption in the transmission of electrical signals representing a message recorded in a telephone answering machine associated with the device so as to enable detection of an incoming shutdown signal, the device comprising a detector which is sensitive to an incoming shutdown signal having a predetermined frequency within the audio range and an amplitude lower than the maximum amplitude of said electrical signals, switching means adapted, when actuated, to effect first and second switching operations, and means for sensing the amplitude of the said electrical signals representing telephone answering machine recorded messages and for actuating the switching means when the amplitude of the said electrical signals falls below a predetermined level and remains below that level for a predetermined short interval of time within the period during which a recorded message is



being transmitted, the switching means comprising a first switch adapted, when the switching means is actuated, to effect the first switching operation, which causes transmission of the said electrical signals to be interrupted, and a second switch which is then adapted to effect the second switching operation which enables the detector to sense the said incoming shutdown signal of predetermined frequency and to generate an output signal for disconnecting the machine from the telephone line.

4,105,867

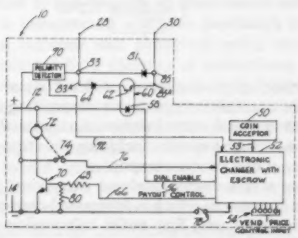
CONTROL CIRCUIT FOR PAY TELEPHONES AND THE LIKE

Joseph L. Levasseur, and William A. Seiter, both of St. Louis County, Mo., assignors to H. R. Electronics Company, High Ridge, Mo.

Filed Feb. 7, 1977, Ser. No. 765,931

Int. Cl.[2] H04M *17/02*

U.S. Cl. 179—6.3 R **47 Claims**



1. Control means for electrically communicating a transmission control of a pay telecommunications station to a telecommunications system, comprising coin controlled means including a coin deposit unit for accepting coins of one or more denominations and producing a deposit signal representative of the value of each coin accepted during a telecommunications station operation, price control means for establishing a reference signal representative of the cost charge for effecting said electrical communication, entry means having a first input means connected to said coin deposit unit to receive each deposit signal and a second input means connected to said price

control means to receive said reference signal, said entry means producing an output when the value of one or more coins accepted equals or exceeds the cost charge, output control means having an input connected to said entry means to receive said output, said output control means including switch means having a first connection to the transmission control and a second connection to said telecommunications system, said switch means including means for responding to said output to effect an electrical communication between said first and said second connections, and refund means operatively connected to said entry means, said refund means being operable independently of the specific coins deposited during that telecommunications station operation, and including means responsive to said output to effect exact payback of any excess amount accepted.

4,105,868

AM STEREOPHONIC TRANSMISSION SYSTEM

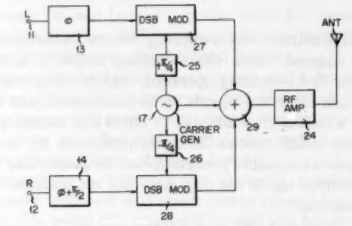
Susumu Takahashi, and Hirotaka Kurata, both of Tokyo, Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1976, Ser. No. 753,299

Claims priority, application Japan, Dec. 26, 1975, 51-158605; Dec. 26, 1975, 51-158607

Int. Cl.[2] H04H *5/00*

U.S. Cl. 179—15 BT **15 Claims**



1. A method of producing a broadcast signal for an AM stereophonic transmission system for transmitting stereophonically related first and second audio information signals by an amplitude modulation system, including the steps of:

generating a first carrier component;

generating a first double-sideband component of a second carrier component which is suppressed-carrier amplitude-modulated by said first audio information signal, said second carrier component having the same frequency as that of said first carrier component and being advanced in phase by substantially 45° with respect to said first carrier component; and

generating a second double-sideband component of a third carrier component which is suppressed-carrier amplitude-modulated by a second audio information signal phase-shifted by substantially 90° relative to said first audio information signal, said third carrier component having the same frequency as that of said first carrier component and being retarded in phase by substantially 45° with respect to said first carrier component.

6. A receiver for reproducing stereophonically related first and second audio information signals from a broadcast signal including a first carrier component, a first double sideband component of a second carrier component suppressed-carrier, amplitude-modulated by the first audio information signal, said second carrier component being advanced in phase by substantially 45° with respect to said first carrier component, and a second double-sideband component of a third carrier component being suppressed-carrier amplitude-modulated by the second audio information phase-shifted by substantially 90° relative to the first audio information signal, said third carrier component being retarded in phase by substantially 45° with respect to said first carrier component, said receiver comprising:

synchronous carrier generating means for generating synchronous carriers in response to the broadcast signal received by an antenna; and

means for demodulating said first and second audio information signals in response to said synchronous carriers from said synchronous carrier generating means and said braodcast signal received by the antenna,

said means for demodulating comprising:

phase-shift means for phase shifting a first synchronous carrier from said synchronous carrier generating means to produce a second and third synchronous carriers, said second and third synchronous carrier being advanced and retarded in phase by 45° with respect to said first synchronous carrier, respectively;

first demodulation means for demodulating said first audio information signal in response to the broadcast signal received by the antenna and said second synchronous carrier; and

second demodulation means for demodulating the second audio information signal phase-shifted by substantially 90° relative to said first audio information signal in response to said third synchronous carrier and the broadcast signal.

4,105,869

TIME-DIVISION MULTIPLEX DIGITAL TRANSMISSION SYSTEM WITH INTERMEDIATE STATIONS ADAPTED TO TRANSIT INSERT AND EXTRACT DIGITAL CHANNELS

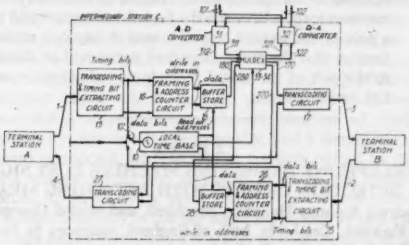
André A. Aveneau, Longpont sur Orge, and Xavier N. Barbier, Le Plessis Trevise, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Dec. 5, 1977, Ser. No. 857,813

Claims priority, application France, Dec. 10, 1976, 76 37357

Int. Cl.[2] H04J *3/08*

U.S. Cl. 179—15 BD **3 Claims**



1. A time-division multiplex digital transmission system having two terminal stations and at least one intermediate station connecting said terminal stations by first and second multi-channel digital multiplex lines corresponding to both of the transmission directions through the intermediate stations, each digital channel of each multiplex line being allocated to a recurrent time slot of a frame whereby the system is adapted, in each intermediate station, to transit digital channels allocated to corresponding time slots of the multiplex lines as well as to extract digital channels from one of the multiplex lines for

a local line of the intermediate station and to insert from the local line to other multiplex lines the digital channels allocated to corresponding time slots according to the two transmission directions or the reverse, each of said intermediate stations further comprising:

means for emitting local channels from said local lines to said multiplex lines;

means for receiving local channels from said multiplex lines to said local lines;

first means for extracting timing signals from digital channels transmitted on said first multiplex line;

second means for extracting timing signals from digital channels transmitted on said second multiplex line;

a single time base controlled by said timing signals from said first or second extraction means but said time base being able to oscillate freely in absence of timing signals;

first storing means for receiving digital channels from said first multiplex line;

first means for addressing said first storing means for write-in by said first extracting means and for read-out by said time base;

second storing means for receiving digital channels from said second multiplex line;

second means for addressing said second storing means for write-in by said second extraction means and for read-out by said time base;

one channel multiplexer and demultiplexer;

said first and second storing means and said local channel emitting means being connected to inputs of said multiplexer;

the digital channel emitting output to said first and second multiplex lines and said channel receiving means being connected to outputs of said demultiplexer; and

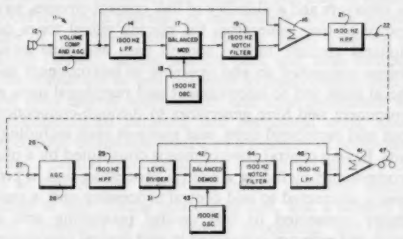
said demultiplexer being adapted to extract and to transmit digital channels from said first or second multiplex line to said local channel receiving means, respectively, when said multiplexer simultaneously inserts and transmits local channels from said local channel emmitting means to said second or first multiplex line, respectively.

4,105,870

NARROW BAND TRANSMISSION SYSTEM AND METHOD

Herman P. Miller, III, P.O. Box 2163, Stockton, Calif. 95201

Filed Nov. 23, 1976, Ser. No. 744,305
Int. Cl.[2] H04B *1/66*
U.S. Cl. 179—15.55 R **15 Claims**



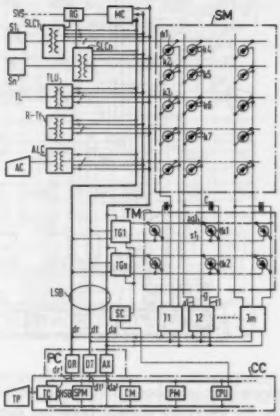
1. In a method for transmitting signals having high and low frequency components which are displaced in time in such manner that only one of the components is present at a significant energy level at any instant of time, the steps of: continuously translating a first one of the components to the frequency range of the second component with no switching of the first component, combining the translated component with the first and second components with no switching of any of said components, and removing the first component from the combined signal to provide an output signal consisting of the second component and the translated first component.

4,105,871

ELECTRONIC TELEPHONE SYSTEM FEATURING A CUSTOMER MEMORY WITHIN A CENTRAL CONTROL UNIT CONNECTED BY BUS LINES

Edwin Rowland Ely, Marlton, N.J.; David Moore Weigand, West Chester, and Hans Herbert Treichel, Philadelphia, both of Pa., assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 1, 1977, Ser. No. 773,309
Int. Cl.[2] H04Q *3/52*
U.S. Cl. 179—18 AD **1 Claim**



1. In an electronic telephone switching system having peripheral units for carrying signals between subscribers, said peripheral units including a plurality of trunk and tie line circuits, at least one attendant line circuit, a plurality of signaling tone receivers and a plurality of link control circuits, having a plurality of tone generators for applying signal tones to said peripheral units, having speech path and tone switching matrices connected to and operable to interconnect said peripheral units and to interconnect said tone generators with through connections between said peripheral units, having control means constituted by a plurality of components including a central processing unit, a program memory connected to said central processing unit, a customer memory connected to said central processing unit, and a scratch pad memory connected to said central processing unit, having system timing means connected to said central processing unit and to said program, customer and scratch pad memories, and having bus lines interconnecting the components of said central control means and other bus lines for connecting said peripheral units to said central control means, the improvement comprising:

means connecting said customer memory to receive data, command and address signals via said bus lines, said means carrying faster rise time pulses than said othe bus lines, for enabling control by said central control means,

circuit means for coupling the data, command and address signals in the form of changing potentials to said customer memory including capacitor means coupling said circuit means to said customer memory, and

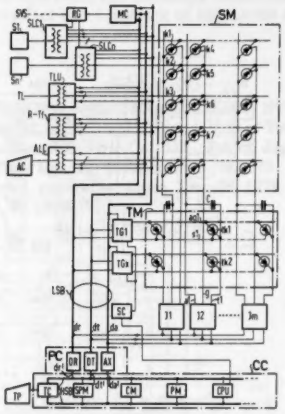
alternately activated plural transistor switches responsive to differing potentials from said data, command and address signals for supplying potentials to said capacitor means

4,105,872

ELECTRONIC TELEPHONE SYSTEM INCLUDING INTEREXCHANGE TRUNK REPEATERS FOR TRAFFIC WITH OTHER SYSTEMS

James Louis Parise, Cherry Hill; Carl Michael Schneider, Cinnaminson, and John Francis Farrell, Mt. Laurel, all of N.J., assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 1, 1977, Ser. No. 773,310
Int. Cl.[2] H04Q 3/52
U.S. Cl. 179—18 AD 2 Claims



1. In an electronic telephone switching system having peripheral units for carrying signals between subscribers, said peripheral units including a plurality of trunk and tie line circuits, at least one attendant line circuit, a plurality of signaling tone receivers and a plurality of link control circuits, having a plurality of tone generators for placing signal tones on said peripheral circuits, having speech path and tone switching matrices connected to and operable to interconnect said peripheral units and to interconnect said tone generators with through-connections between said peripheral units, having central control means constituted by a plurality of components including a central processing unit, a program memory connected to said central processing unit, a customer memory connected to said central processing unit, and a scratch pad memory connected to said central processing unit, having system timing means connected to said central processing unit, and having bus lines interconnecting the components of said central control means and other bus lines for connecting said peripheral units to said central control means, the improvement comprising:

means in said trunk line circuits connected between tip and ring conductors for receiving different kinds of incoming seizure signals, as well as for controlling ring and dial signals, said means comprising:

a bridge rectifier circuit having terminals of one diagonal connected to said tip and ring conductors for receiving incoming seizure and ring signals and forming a current loop for those signals, and

means comprising a plurality of parallel-connected circuits for regulating the loop current, including first circuit means for transmitting outgoing seizure signals connected across the other diagonal of said bridge rectifier circuit,

second circuit means for transmitting supervisory signals connected across the other diagonal of said bridge rectifier circuit, and

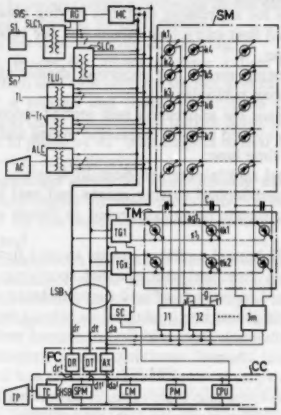
third circuit means for transmitting dial signals connected across the other diagonal of said bridge rectifier circuit.

4,105,873

ELECTRONIC TELEPHONE SWITCHING SYSTEM COMPRISING A SPEECH PATH SWITCHING MATRIX AND TONE-CONNECTING SWITCHING MATRIX AND EMPLOYING ELECTRONIC CROSSPOINT SWITCHES

Frederick William Schimmel, Gibbsboro, N.J., assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 1, 1977, Ser. No. 773,311
Int. Cl.[2] H04Q 3/52; H04M 3/00
U.S. Cl. 179—18 AD 2 Claims



1. In an electronic telephone switching system having peripheral units for carrying signals between subscribers, said peripheral units including a plurality of trunk and tie line circuits, at least one attendant line circuit, a plurality of signaling tone receivers and a plurality of link control circuits, having a plurality of tone generators for placing signal tones on said peripheral circuits, having speech path and tone switching matrices connected to and operable to interconnect said peripheral units and to interconnect said peripheral units and to interconnect said tone generators to through-connections between said peripheral units, said matrices each including cross points, having central control means constituted by a plurality of components including a central processing unit, a program memory connected to said central processing unit, a customer memory connected to said central processing unit and a scratch pad memory connected to said central processing unit, having system timing means connected to said central processing unit, and having bus lines interconnecting the components of said central control means and other bus lines for connecting said peripheral units to said central control means, the improvement comprising:

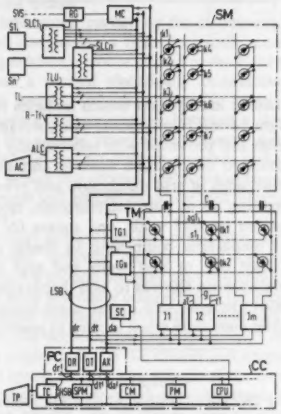
a plurality of three-terminal electronic switch means connected as cross point switches at respective cross points of said matrices, one of the terminals of each of said switch means in said speech path matrix being coupled to said central control means for regulating the attenuation of a speech path wire forming a through-connection.

4,105,874

CENTRALLY CONTROLLED ELECTRONIC TELEPHONE SYSTEM HAVING A CUSTOMER MEMORY FOR STORING INFORMATION ON TWO OR MORE DIFFERENT SUBSCRIBER STATIONS AND PERIPHERAL EQUIPMENT-SPECIFIC INFORMATION

Edwin Rowland Ely, Marlton, N.J.; David Moore Weigand, West Chester, and Hans Herbert Treichel, Philadelphia, both of Pa., assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 1, 1977, Ser. No. 773,313
Int. Cl.[2] H04Q 3/52
U.S. Cl. 179—18 AD 2 Claims



1. In an electronic telephone switching system having peripheral units for carrying signals between subscribers, said peripheral units including a plurality of trunk and tie line circuits, at least one attendant line circuit, a plurality of signaling tone receivers and a plurality of link control circuits, having a plurality of tone generators for placing signal tones on said peripheral circuits, having speech path and tone switching matrices connected to and operable to interconnect said peripheral units and to interconnect said tone generators with through-connections between said peripheral units, having central control means constituted by a plurality of components including a central processing unit, a program memory connected to said central processing unit, a customer memory connected to said central processing unit, and a scratch pad memory connected to said central processing unit, having system timing means connected to said central processing unit, and having bus lines interconnecting the components of said central control means and other bus lines for connecting said peripheral units to said central control means, the improvement comprising:

a plurality of registers in said customer memory for receiving and storing information regarding individual ones of said peripheral units; and

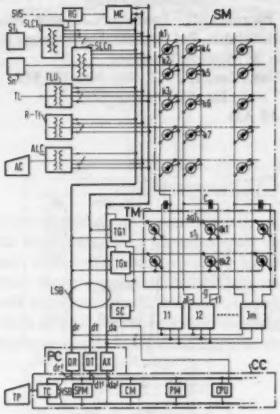
additional memory means for controlling the writing, reading and erasing of information stored in said plurality of registers.

4,105,875

ELECTRONIC TELEPHONE SWITCHING SYSTEM COMPRISING A SPEECH-PATH SWITCHING MATRIX AND TONE-CONNECTING MATRIX AND EMPLOYING ELECTRONIC CROSSPOINT SWITCHING DEVICES

Carl Michael Schneider, Cinnaminson; Frederick William Schimmel, Gibbsboro, and John Francis Farrell, Mt. Laurel, all of N.J., assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 1, 1977, Ser. No. 773,314
Int. Cl.[2] H04Q 3/52
U.S. Cl. 179—18 GF 4 Claims



1. In an electronic telephone switching system having peripheral units including a plurality of trunk and tie line circuits, at least one attendant line circuit, a plurality of signaling tone receivers and a plurality of link control circuits, having a plurality of tone generators, having speech path and tone switching matrices for interconnecting said peripheral units and for connecting said tone generators to a through-connection between ones of said peripheral units, having a central control means constituted by a plurality of components including a central processing unit, program memory, customer memory and a scratch pad memory, having system timing means, and having bus lines interconnecting the components of said central control means for transmitting information pulses therebetween and other bus lines connecting said peripheral units to said central control means, the improvement comprising:

said speech path and said tone switching matrices being formed as one-wire switching matrices,

a plurality of electronic crosspoint switch means, a switch means being located at each crosspoint of said switching matrices, each said switch means having a conducting path terminated by first and second terminals and a control terminal for controlling the state of conduction of said conducting path,

said first and control terminals of said switch means in each coordinate in a first direction of said speech path matrix being connected in parallel to said link circuit, said second terminals of said speech path matrix switch means being connected, respectively, to coordinates in a second direction thereof,

said first and control terminals of said switch means in each second direction coordinates of said tone matrix being connected in parallel to a said tone generator, said second terminals of said tone matrix switch means being connected, respectively, to first direction coordinates therein, said tone matrix first direction coordinates being coupled, respectively, to said first direction coordinates of said speech path matrix to which said first terminals of said speech path matrix are connected,

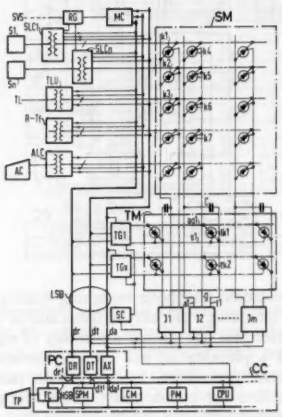
means for polling different ones of said peripheral units and of said link control circuits for defining the coordinates of given crosspoints in the speech path and tone matrices.

4,105,876

ELECTRONIC TELEPHONE SYSTEM FEATURING PERIODIC SCANNING OF ALL PERIPHERAL UNITS AND POLLING OF SPECIFIC PERIPHERAL UNITS FOR TRANSMISSION OF STATUS AND/OR INSTRUCTION INFORMATION

John Francis Farrell, Mt. Laurel, N.J., and Hans Herbert Treichel, Philadelphia, Pa., assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 1, 1977, Ser. No. 773,315
Int. Cl.² H04Q 3/52
U.S. Cl. 179—18 AD **2 Claims**



1. In an electronic telephone switching system having peripheral units for carrying signals between subscribers, said peripheral units including a plurality of trunk and tie line circuits, at least one attendant line circuit, a plurality of signaling tone receivers and a plurality of link control circuits, having a plurality of tone generators for placing signal tones on said peripheral units, having speech path and tone switching matrices connected to and operable to interconnect said peripheral units and to interconnect said tone generators with through-connections between said peripheral units, having central control means constituted by a plurality of components including a central processing unit, a program memory connected to said central processsing unit, a customer memory connected to said central processing unit and a scratch pad memory connected to said central processing unit, having system timing means connected to said central processing unit, and having bus lines interconnecting the components of said central control means and other bus lines for connecting said peripheral units to said central control means, the improvement comprising:

said bus lines including means carrying information pulses having fast rise times;

said other bus lines including means carrying information pulses having rise times which are slow compared to the rise times of information pulses being carried by the first-mentioned bus lines, the information pulses of the first-mentioned bus lines and on said other bus lines having the same speed of transmission; and

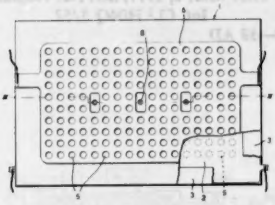
interface means for connecting the first-mentioned bus lines to said other bus lines at said central control means.

4,105,877

ELECTROSTATIC LOUDSPEAKER HAVING ELASTIC DIAPHRAGM SPACER ELEMENTS CURED IN SITU

Bernardus Gradus Peters, 428 Houtsnijdershorst, Apeldoorn, Netherlands

Filed Apr. 25, 1977, Ser. No. 790,579
Int. Cl.² H04R 19/02
U.S. Cl. 179—111 R **4 Claims**



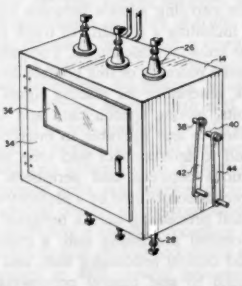
1. An electrostatic loudspeaker which includes in combination: a diaphragm having two opposite sides, a frame supporting said diaphram and provided with substantially rigid walls respectively arranged on opposite sides of and spaced from said two opposite sides of said diaphragm and provided with means for permitting air to pass therethrough, electrodes respectively mounted on said walls, and means for elastically supporting said diaphragm comprising an elastic mass interconnecting at least one of said walls and said diaphragm, wherein said elastic mass adheres to said diaphragm and does not exert pressure thereon, said elastic mass being in a state prior to the elastic mass state when located in position initially.

4,105,878

VACUUM INTERRUPTER AND DISCONNECT COMBINATION

Kazuo H. Date, and Ronald A. Wainio, both of South Milwaukee, Wis., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Jan. 17, 1977, Ser. No. 759,656
Int. Cl.² H01H 33/12, 33/66
U.S. Cl. 200—146 R **12 Claims**



1. In a circuit interrupter and visible break disconnect combination which includes support means, an interrupter operating means mounted on the support means, and a disconnect operating means mounted on the support means, at least one switching assembly comprising:

first and second spaced apart electrical insulator support members, affixed to the support means;

a first electrically conductive terminal member affixed to one end of the first insulator support member;

a second electrically conductive terminal member affixed to one end of the second insulator support member;

an elongated, electrically insulative disconnect support

member, pivotably mounted at one end thereof to the second terminal member for rotation about an axis of the second terminal member between a close and an open position;

a third electrically conductive terminal member, affixed to an opposite end of the disconnect support member, which is engaged with the first terminal member when the disconnect support member is in its close position, and is disengaged and spaced from the first terminal member when the disconnect support member is in its open position;

an insulative disconnect connecting link means, having one end pivotably attached to a median portion of the disconnect support member and another end attached to the disconnect operating means, for connecting the disconnect support member for pivotal movement by the disconnect operating means, between the open and close positions of the disconnect support member corresponding to respective open and close positions of the disconnect operating means;

a circuit interrupter carried by the disconnect support member and comprising a first electrically conductive interrupting contact member affixed to the third terminal member, and a second electrically conductive interrupting contact member which is movable relative to the first interrupting contact member between a closed position at which the second interrupting contact member engages the first interrupting contact member, and a tripped position at which the second interrupting contact member is disengaged and spaced from the first interrupting contact member;

an electrically conductive bell crank pivotably mounted to the second terminal member, for rotation between a closed and a tripped position, said bell crank having one of its two arms pivotably connected to the second interrupting contact member so that the closed and tripped positions of the second interrupting contact member corresponds respectively to the closed and tripped position of the bell crank, and the pivotal axis of the second interrupting contact member about the bell crank arm coincides with the pivotal axis of the disconnect support member about the second terminal member when the bell crank is disposed in its tripped position;

an insulative interrupter connecting link means having one end pivotably attached to the other arm of the bell crank and another end attached to the interrupter operating means, for connecting the bell crank for rotation by the interrupter operating means between the tripped and closed positions of the bell crank, corresponding to respective tripped and closed positions of the interrupter operating means.

4,105,879

MAGNETIC PUFFER TYPE GAS CIRCUIT BREAKER

Masanori Tsukushi, Hitachi; Katsuichi Kashimura, Takahagi; Kunio Hirasawa, and Yoshio Yoshioka, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

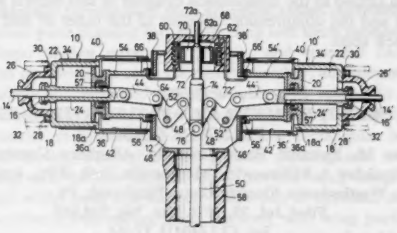
Filed Mar. 7, 1977, Ser. No. 775,196

Claims priority, application Japan, Mar. 12, 1976, 51-26160

Int. Cl.[2] H01H *33/88*

U.S. Cl. 200—148 A **15 Claims**

7. A magnetic puffer type gas circuit breaker comprising at least one pair of contacts mounted for movement into and out of contact with each other; a puffer unit including a puffer cylinder and a puffer piston responsive to opening of said contacts for compressing an arc-extinguishing gas and blowing it against arcs produced between said opening contacts; operating means for effecting opening and closing of said contacts; an electromagnetic driving unit for aiding the opening operation of said operating means and the operation of said puffer unit including an electromagnetic coil connected to receive the current to-be-interrupted, and an electromagnetic repulsive member electromagnetically coupled with said electromagnetic coil and connected to said operating means for movement in a closing direction and a breaking direction to produce an electromagnetic repulsive force aiding the opening operation of said operating means; and commutation unit which commutates the current to-be-interrupted to said electromagnetic coil upon opening of said contacts; said electromagnetic repulsive member being so constructed that a closed portion of said contacts, the electromagnetic neutral position of said member deviates slightly on the closing side with respect to the electro-



magnetic center of said electromagnetic coil, and that absolute values of the electromagnetic forces of said electromagnetic coil and said electromagnetic repulsive member at points equally distant from a point at which the electromagnetic center of said electromagnetic coil and the electromagnetic neutral position of said electromagnetic repulsive member are coincident become smaller on the closing side than on a breaking side.

4,105,880

ARC BLOW-OUT SWITCH

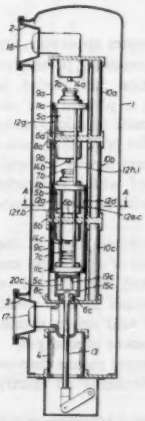
Günter Rapp, Kassel-Be, and Marcel Celestin Konrad, Kassel-Wilh, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 12, 1977, Ser. No. 758,870

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1976, 2601857

Int. Cl.[2] H01H *33/88*

U.S. Cl. 200—148 A **5 Claims**



1. In an arc blow-out switch having a central switch unit and two outer switch units arranged in tandem; means for supporting the switch units; each switch unit including a movable compression cylinder and a stationary compression piston arranged in the compression cylinder; axially aligned insulating cylinders surrounding each switch unit; actuator rod means connected to the compression cylinders for moving them as a

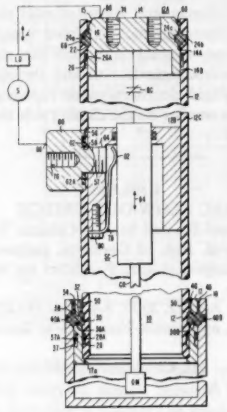
unit to effect circuit making and circuit breaking operations, and a switch drive arranged adjacent one of the outer switch units for driving the actuator rod means; the improvement wherein said actuator rod means couple said switch drive to the compression cylinders of the three switch units and comprise a total of six actuator rods each affixed to the compression cylinder of said one of said outer switch units and to the compression cylinder of said central switch unit; said actuator rod means further comprising a total of three actuator rods each affixed to the compression cylinder of said central switch unit and the compression cylinder of the other of said outer switch units.

4,105,881

CIRCUIT BREAKER APPARATUS WITH STATIC PRESSURE LOCK

Peter M. Kowalik, Penn Township, Allegheny County, and Stanislaw A. Milianowicz, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 29, 1976, Ser. No. 709,848
Int. Cl.[2] H01H *33/64*
U.S. Cl. 200—148 B **28 Claims**



1. Circuit interrupter apparatus, comprising:
a. a vessel for containing pressurized gas at the time of current interruption and having an opening therein, said vessel having a plurality of indentations on a portion thereof proximate to said opening;
b. cover means for protruding into and closing said opening, said cover means having a plurality of indentations on the portion thereof which protrudes into said opening and which align with an equal number of said indentations in said vessel;
c. a mass of hardened material disposed originally as fluid material in each of a sufficient number of said cover means indentations and said aligned vessel indentations to key said cover means to said vessel to prevent substantial movement of said cover means away from said vessel under the pressure of said gas;
d. separable contact means disposed within said vessel for making and breaking an electrical circuit in a gaseous atmosphere;
e. operating means interconnected mechanically with said separable contact means for opening and closing said separable contact means; and
f. electrical terminal means disposed upon said vessel in electrical relationship with said separable contact means and adapted to interconnect said contact means with said electrical circuit.

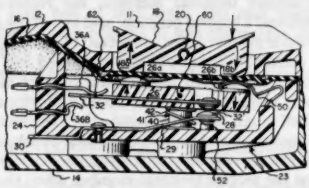
25. A method for covering an opening in a gas containing vessel with cover means, comprising the steps of:
a. placing a plurality of keying indentations on a portion of said vessel proximate to said opening;
b. placing a plurality of keying indentations on a portion of said cover means;
c. placing a gasket indentation on a portion of said vessel, wherein said vessel keying indentations are closer to the opened end of said vessel than said gasket indentation is;
d. disposing said cover means in said opening at a distance therein which is further from said opening than either said vessel keying indentations or said gasket indentations;
e. inserting a gasket in said gasket indentation;
f. moving said cover means towards said opening to overlap said gasket and align an equal number of vessel keying indentations and cover means keying indentations;
g. disposing fluid material which may be subsequently hardened in each of a sufficient number of cover means keying indentations and aligned vessel keying indentations to subsequently key said cover means to said vessel; and
h. hardening said fluid material into a mass to key said cover means to said vessel to prevent substantial movement of said cover means relative to said vessel.

4,105,882

CONTROL STATION SWITCH

Otmar M. Ulbing, Webster, and Edmund R. Koval, Tonawanda, both of N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Mar. 3, 1977, Ser. No. 773,975
Int. Cl.[2] H01H *21/10*
U.S. Cl. 200—157 **23 Claims**



1. A pressure actuated switching apparatus, wherein said switching apparatus comprising:
a. a base having first and second electrical base contact means longitudinally spaced and electrically insulated from one another;
b. an armature having a longitudinal axis and having first and second electrical armature contacts longitudinally spaced from one another, said first and second electrical armature contacts being connected by an electrical conductor;
c. means acting between said base and said armature for resiliently mounting said armature laterally of said base with said first and second electrical armature contacts adjacent to said first and second electrical base contact means respectively, said mounting means permitting rotational movement of said armature about a plurality of axes transverse to the longitudinal axis of said armature, whereby a laterally directed force applied to either of said first or second ends of said armature tends to produce rotational movement of said armature about one of said plurality of axes, said axes including at least a first and a second transverse axis, said first transverse axis positioned intermediate said first and second electrical contacts of said armature, said second transverse axis positioned at the point of contact between said first armature contact and said first base contact means; whereby pressure applied at one end of said armature tends to produce a first rotation about said first axis until said first armature contact and said first base contact means are brought into electrical contact and whereby continued pressure on said armature tends to produce a second rotation about said second axis until said second armature contact and said second base

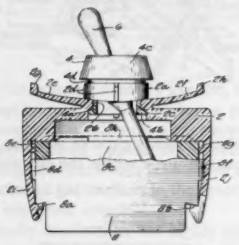
contact means are brought into electrical contact with one another.

4,105,883

ELECTRIC SWITCH HAVING A FRAME WITH IMPROVED SNAP-IN BASE RETENTION MEANS

Jerome K. Hastings, Sussex, and Earl T. Piber, Oconomowoc, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Jun. 9, 1976, Ser. No. 694,389
Int. Cl.² H01H *9/00*
U.S. Cl. 200—296 **8 Claims**



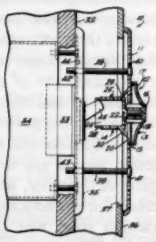
1. An electric switch comprising:
a switch housing comprising a base enclosing switch contacts and a frame overlying said base and having an aperture;
an actuator mounted to said frame and extending through said aperture for operating the switch contacts within said base;
and means for snap-in mounting said frame and base to one another comprising:
undercut portions on opposite ends of said base;
a pair of spaced, depending legs on said frame curving gradually inwardly toward one another and tapering downwardly toward their lower ends for even stress distribution and having hooks at their lower ends; said legs being flexible to afford spreading thereof to receive said base therebetween so that said hooks snap-in to grip said undercut portions while said hooks and the upward and inward stresses or forces in said legs resulting from the forced partial unrolling of the curvature in said legs provide inward and upward bias on said base to secure it rigidly to said frame while taking up small dimensional tolerances in said base.

4,105,884

ELECTRICAL TOGGLE SWITCH LEVER EXTENDER

Arnold M. Damsky, 821 83rd St., Miami Beach, Fla. 33141

Filed Apr. 4, 1977, Ser. No. 784,042
Int. Cl.² H01H *3/20*
U.S. Cl. 200—331 **5 Claims**



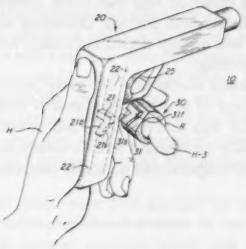
1. In an electrical toggle switch lever extender for use in association with a toggle switch cover plate of the type having an elongated opening for the passage of a toggle switch lever, the improvement comprising, an actuating member receivable in said elongated opening in the cover plate for reciprocative motion with respect thereto in the direction of the major axis of said elongated opening, said actuating member comprising a knob portion at the outside of the cover plate and a recessed carrier portion at the inside of the the cover plate for the reception of an electrical toggle switch lever to be extended, said actuating member knob portion comprising a knob member integrally formed with slide abutment means receivable in the cover plate opening for constraining said knob member to rectilinear sliding movement therein, said recessed carrier portion comprising a separate carrier member, and means for removably attaching said carrier member with respect to said knob member at zones thereof within said cover plate opening, said carrier member comprising a hollow rectangular body portion having a terminal end portion defining said recess opening, said carrier member body portion being integrally formed, at the inner end thereof, with a pair of opposed, angularly-outwardly-extending wing portions, said wing portions projecting beyond the outer surface of the inside of said body portion and terminating in a plane parallel with the plane of said body portion outer surface.

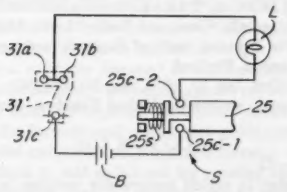
4,105,885

HAND OPERATED INSTRUMENTS HAVING NON-MAGNETIC SAFETY SWITCH

Henry Orenstein, Verona, N.J., assignor to Consumer Concepts, Inc., Union, N.J.

Filed Jun. 22, 1976, Ser. No. 698,713
Int. Cl.² H01H *35/00, 9/06*; F41C *19/12*; A44C *13/00*
U.S. Cl. 200—52 R **10 Claims**





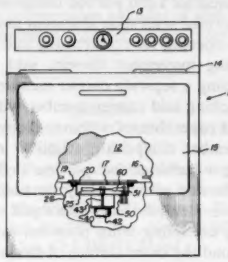
1. A hand operated instrument which comprises
a housing;
a recess in a hand holdable portion of said housing;
said recess having fixed configuration contact means therein;
said contact means being engagable by a non-magnetic bridging contactor on an outer peripheral face of a ring worn by the operator of said instrument; and
said bridging contactor being insertable in said recess and engages said contact means whereby said instrument becomes operational.

4,105,886

MICROWAVE ENERGY FEED SYSTEM FOR COMBINATION COOKING APPARATUS

David Alan Baron, Edina, and James Ronald Hampton, Brooklyn Center, both of Minn., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jul. 6, 1976, Ser. No. 702,489
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 E 1 Claim



1. A domestic cooking appliance having surface heating elements and an oven cavity, said oven cavity adapted to cook foods with either microwave energy alone or thermal energy alone or both simultaneously, thermal heating means mounted in said oven cavity, said cavity having a portion cut away from the bottom wall thereof;

microwave energy feed means subjacent said cavity in energy transmitting communication therewith through said cut-away portion, said feed means comprising a box-like housing of substantially smaller size and dimensions than said oven cavity mounted to the underside of said cavity, the perimeter dimensions of said housing substantially matching those of said cut away portion, a magnetron having an antenna portion extending directly into said housing, and energy deflecting means rotatably mounted in said housing;

covering means across said cut-away portion and covering said housing to prevent the egress of food materials from said cavity into said housing, said covering means being substantially transparent to microwave energy and able to withstand temperatures normally encountered in cooking.

4,105,887

WELDING APPARATUS AND METHOD

Denis John Marshall, Ware, and Terry Martin Mohin, Woodgate End Nr Broxted, both of England, assignors to BOC Limited, London, England

Filed Jan. 27, 1976, Ser. No. 652,742
Claims priority, application United Kingdom, Nov. 18, 1975, 47498/75
Int. Cl.[2] B23K 9/16
U.S. Cl. 219—72 2 Claims

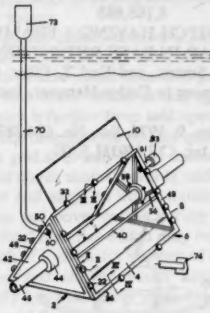
1. A chamber in which underwater welding is able to be performed, having:

(a) means to secure said chamber to an underwater structure;

(b) walls and an open base, whereby when the chamber is secured to the structure and when gas is passed into the chamber, water is displaced therefrom through the open base and a gas space is created therein;

(c) a frame including at least two spaced apart upwardly extending channel members facing each other;

(d) panels engaged in a gas-tight manner with the frame so as to form the walls of the chamber; at least one of the panels being of transparent material and forming a side of the chamber being slidably movable within said channels relative to the frame to make an opening in the frame



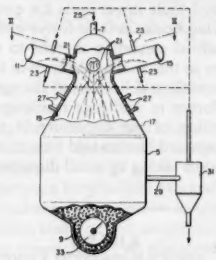
through which a welding rod or welding gun is able to be inserted into the space within the chamber.

4,105,888

ARC HEATER APPARATUS FOR PRODUCING ACETYLENE FROM HEAVY HYDROCARBONS

Maurice G. Fey, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 9, 1976, Ser. No. 703,740
Int. Cl.[2] H05B 7/18
U.S. Cl. 219—121 P 3 Claims

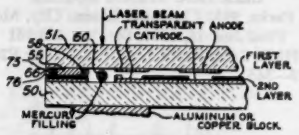


1. Arc heater apparatus for producing acetylene from heavy hydrocarbon, comprising walls forming a plenum chamber having a substantially vertical axis, a plurality of arc heaters at the upper end of the chamber and including a pair of axially spaced substantially cylindrical electrodes forming a narrow gap therebetween and adapted to be connected to a source of potential to produce an arc therebetween, the electrodes defining an arc chamber that communicates with the plenum chamber, the axes of the arc chambers of the arc heaters being inclined upwardly from the vertical axis, gas inlet means communicating with the gap for introducing a non-conductive reducing gas into the arc chamber, the arc heaters being productive of an arc heated plasma gas to effect a downstream reaction zone in a plenum chamber, second inlet means upstream of the arc heaters for introducing heavy hydrocarbon material into the reaction zone, and the walls forming the plenum chamber diverging downwardly and outwardly from the location of the arc heaters so that deposits of solid reaction products on the walls are minimized.

4,105,889
LASER METHOD OF INTRODUCING MERCURY TO GAS DISCHARGE DISPLAY PANELS

George A. Kupsky, State College, Pa., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 492,992, Jul. 30, 1974, Pat. No. 4,009,407. This application Nov. 16, 1976, Ser. No. 742,327
Int. Cl.[2] B23K 26/00
U.S. Cl. 219—121 LM 2 Claims



1. A process of introducing mercury in a flat, tubulationless, gas discharge display panel device having a pair of spaced opposed laser transparent windows in glass plates forming said device, said windows being outside the information display area of said discharge device, a laser activatable mercury giver located in the discharge gas medium in the space between said laser transparent windows, comprising

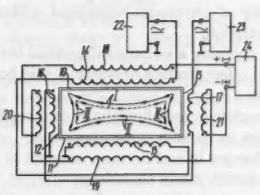
placing a thermally conductive, not highly reflective metal block on the exterior surface of one of said windows,

directing a beam of laser energy through the other of said windows onto said laser activatable giver to cause elemental mercury to be released within the gas medium in said device.

4,105,890
DEVICE FOR ELECTRON-BEAM HEATING OF MATERIALS

Boris Alexeevich Movchan, ulitsa Darvina, 7, kv. 7; Viktor Alexandrovich Timashov, Vozdukhoflotsky prospekt, 5, kv. 10, and Konstantin Nikolaevich Kljuev, ulitsa Shota Rustaveli, 30, kv. 13, all of Kiev, U.S.S.R.

Filed May 2, 1977, Ser. No. 792,981
Claims priority, application U.S.S.R., May 3, 1976, 2355080
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—121 EB 2 Claims



1. A device for electron-beam heating of materials comprising:

an electron gun for producing an electron beam;

an electromagnetic system for controlling said electron beam having

a closed rectangular magnetic circuit provided with four rods;

at least two beam deflection windings arranged on opposite rods of said magnetic circuit and intended to deflect said electron beam in a plane normal to the plane of said beam;

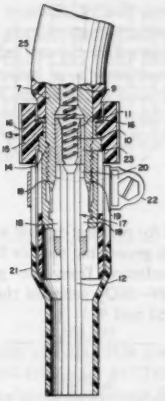
at least two beam correction and spreading windings arranged on the other two opposite rods of said magnetic circuit and intended to deflect said electron beam on the surface of a material being heated; and

at least four windings, each being arranged on a respective rod of said magnetic circuit, the magnetic fields created by the current flowing through said windings forming a magnetic quadrupole lens.

4,105,891
METAL-INERT-GAS WELDING TORCH

Clifford W. Hill; Donald W. Carkhuff, and Frank J. Pilia, all of Florence, S.C., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 540,456, Jan. 13, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,350
Int. Cl.[2] B23K 9/16
U.S. Cl. 219—137.43 7 Claims



1. In a gas shielded consumable electrode arc welding torch including a torch handle, a torch body having a gas passage therein fitting into said handle, a wire guide assembly fastened at one end thereof to said torch body and having a gas passage communicating with the gas passage in said torch body, a tubular contact tip removably attached to the forward end of said wire guide assembly and an insulated nozzle assembly mounted around said contact tip, the improvement of which comprises:

a collet member fitted over said contact tip and having a plurality of resilient spidered sections at one end thereof terminating in tapered portions which seat with mating tapered portions on the forward end of said wire guide assembly whereby said collet member and said contact tip are maintained in alignment with said wire guide assembly, said resilient spidered sections defining a plurality of gas passages adjacent to said contact tip;

a collet nut rotatably fastened to the forward end of said wire guide assembly and engaging said collet member in a manner whereby to permit said collet member to rotate within the forward end of said wire guide assembly when said collet nut is rotatably fastened thereto;

means affixed to said collet nut for rotating said collet nut when fastened onto the forward end of said wire guide assembly and for tightening the engagement between the mating tapered portions of said collet member and wire guide assembly whereby said resilient spidered sections are caused to tightly grasp said contact tip;

means forming a plenum chamber communicating with the gas passage in said wire guide assembly and said plurality of gas passages defined by said resilient spidered sections whereby gas is allowed to pass at least along a portion of said contact tip; and

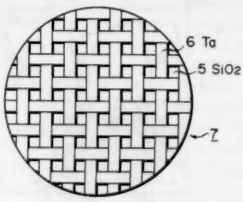
means for independently securing said insulating nozzle assembly onto said collet nut.

4,105,892

THIN RESISTOR FILM TYPE THERMAL HEAD FOR PRINTING ON HEAT-SENSITIVE PAPER

Mitsuhiko Tashiro, Kawasaki; Shouzou Takeno, Yokohama; Kakuo Mihara, Yokohama, and Tadayoshi Kinoshita, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 15, 1977, Ser. No. 816,144
Claims priority, application Japan, Jul. 19, 1976, 51-85008
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 4 Claims



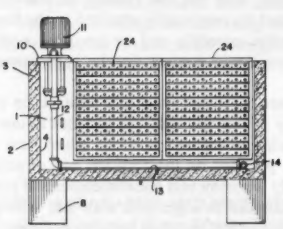
1. A thermal head for printing on heat-sensitive paper which comprises a thin heat-generating resistor film prepared from at least one system selected from the group consisting of Ta—SiO_2 and Ta—N—SiO_2, wherein the content of SiO_2 in each system is 7 to 53 mol %.

4,105,893

APPARATUS AND METHOD FOR TREATING SUGAR CANE STUMPS

Wilson Marcelo Da Silva, Sao Paulo, Brazil, assignor to Cooperativa Central Dos Productores de Acucar e Alcool do Estado de Sao Paulo, Sao Paulo, Brazil

Filed Oct. 29, 1976, Ser. No. 737,105
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—316 3 Claims



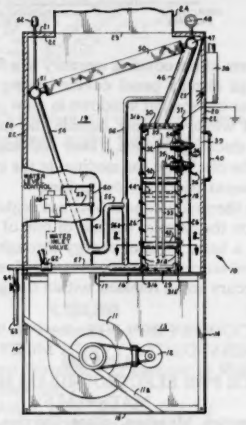
1. In a thermotherapeutic apparatus using water for the treatment of sugar cane stumps left after cutting, a tank of a given depth having upright peripheral walls and a bottom wall, said walls being provided with a layer of material for thermal insulation, said bottom wall having a drain provided with a valve, supporting feet connected with said tank, a supporting plate mounted on one end of the tank, an electric immersion pump mounted on said plate, an upright central tube extending from said pump, a tube extending from said upright tube disposed along the length of the tank near its bottom, and connected, at its opposite end, with a transverse tube near the opposite end of the tank, said tubes being provided with holes for the passage of water, two U-shaped electric resistance heating elements mounted on one lateral wall of the tank and accessable from the outside by means of an opening with a lid in said wall, a thermostat comprising a thermometer mounted on said plate provided with an immersion rod, a box containing a relay mounted on said supporting plate, said relay being controlled by said thermostat to control said resistance heating elements and said pump.

4,105,894

STEAM HEATED HOT AIR FURNACE HAVING AN ELECTRIC STEAM BOILER

John Allen Parks, 5932 Charlotte, Kansas City, Mo. 64110

Filed Jan. 14, 1976, Ser. No. 648,961
Int. Cl.[2] H05B *3/60*; F24H *3/08*; F22B *1/30*; F24D *13/04*
U.S. Cl. 219—365 6 Claims



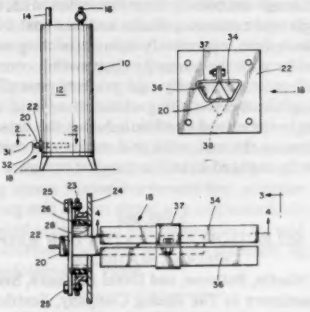
1. A furnace comprising:
a furnace housing having an air inlet;
a boiler located within said housing for containing water;
water level control means for maintaining a predetermined water level within said boiler;
electrical insulation coating the entire inside surfaces of said boiler;
a single pair of electrodes supported within said boiler in spaced relation;
means for applying a voltage differential between said electrodes to effect heating of water in said boiler to the boiling point;
a steam conduit in said housing extending from the top of said boiler to receive steam therefrom;
a heat exchanger in said housing coupled to said steam conduit to receive steam therefrom;
blower means in said housing for forcing a flow of air past said heat exchanger to heat the flowing air by heat exchange with the steam in said steam conduit;
an outlet duct from said housing to direct the heated air out of the housing;
an equalizer line having upper and lower ends, said upper end connected to said steam conduit at the top of said boiler and said lower end connected to said boiler near the bottom thereof;
a Hartford loop located remote from said boiler and being, in vertical elevation, located above the bottom of said boiler but below the water level within the boiler, said Hartford loop having one end connected to said equalizer line intermediate the upper and lower ends thereof; and
a condensate return line interconnecting said heat exchanger and the other end of said Hartford loop whereby condensate from the heat exchanger flows through said return line and through said Hartford loop to said equalizer line for return to said boiler.

4,105,895

ELECTRIC WATER HEATER UTILIZING A HEAT PIPE

James E. Kennedy, Crofton, Md., assignor to Electro-Therm, Inc., Laurel, Md.

Filed Feb. 2, 1976, Ser. No. 654,483
Int. Cl.[2] F24H *1/20*; F28D *15/00*; H05B *3/78*
U.S. Cl. 219—326 11 Claims



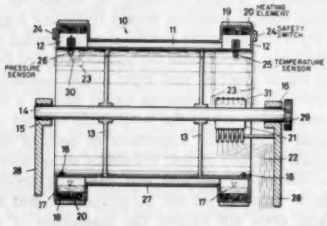
1. A heating device for applying heat to the interior of a substantially closed container containing a liquid therein to be heated, comprising a separate, elongate, cartridge-type electric heating unit, separate, elongate heat transfer means for transferring heat between the ends thereof, said heat transfer means having a heat absorbing end and a heat transmitting end and having high conductivity with a low temperature differential between the ends thereof, means for attaching said heating unit adjacent said heat absorbing end of said heat transfer means, and means for securing said heating device in a fluid-tight manner in a wall of a container with said heat transmitting end of said heat transfer means positioned within the container to apply heat to a liquid in the container, said securing means including a mounting flange having an aperture therein for receiving said cartridge-type electric heating unit, means for holding said heating unit in a fluid-tight manner in said aperture and means for fastening said flange in a fluid-tight manner to the wall of the container about an opening therein.

4,105,896

ROTARY DEVICE FOR PRODUCING AND/OR PROCESSING WEBS, PIECES, FOILS AND COMPOSITE MATERIALS

Wolfgang Schuster, Kalletal, Germany, assignor to Herbert Kannegiesser Kommanditgesellschaft, Vlotho, Germany

Filed Dec. 3, 1975, Ser. No. 637,431
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1975, 2543806
Int. Cl.[2] B21B *27/10*; D06C *15/08*; H05B *3/00*
U.S. Cl. 219—470 7 Claims



1. A rotary device for producing and/or processing webs, pieces, foils and composite materials, more particularly, for processing textile webs and pieces in the field of manufacturing ready-to-wear clothing and for producing and processing foils and composite materials in the field of processing synthetic materials, said rotary device comprising a double-walled hollow cylinder including radially inner and outer spaced walls, end plates at the ends of said walls and defining a vapor condensation chamber such that the radially outer wall is heated by means of vapors condensing thereon, said condensation chamber carrying a liquid for vaporization and condensation, the improvement comprising:

one of said walls including radial projections at opposed ends and defining with said end plates annular compartments of increased radial size relative the portion of said chamber interposed between said annular compartments,

heating elements mounted to said double walled hollow cylinder at said annular compartments, and

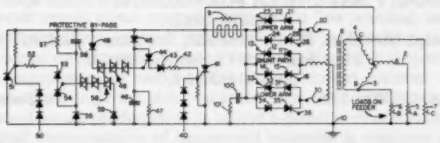
a steel wool packing carried within each annular compartment and extending in a continuous, annular manner throughout each compartment such that said vaporizable liquid is distributed by said steel wool packing throughout said compartment for effective vaporization by energization of said heating elements.

4,105,897

CYCLOCONVERTER APPARATUS AND METHOD FOR WORKING INTO AN ACTIVE LOAD

Lawrence J. Stratton, Lexington; Dennis C. Jeffreys, Bedford; Albert W. Welz, Jr., Westford, and Reed H. Johnston, Wellesley, all of Mass., assignors to New England Power Service Company, Westborough, Mass.

Filed Apr. 13, 1976, Ser. No. 676,468
Int. Cl.[2] H02J *3/02*
U.S. Cl. 307—3 27 Claims



1. A naturally commutated cycloconverter for the use with an external, alternating current power source that supplies power to at least one active impedance, said cycloconverter comprising:

(a) a plurality of selectively controlled, unidirectional current path means arranged in pairs with each pair of unidirectional current path means providing for bidirectional current flow, said pairs being connected in parallel with each other and connected with the external, alternating current power source and said at least one active impedance so that the magnitude and phase of the current supplied to said at least one active impedance from said external, alternating current power source through the plurality of unidirectional current path means are determined by the voltage of the external, alternating current path source and by the said at least one active impedance that is supplied power by said external, alternating current power source;

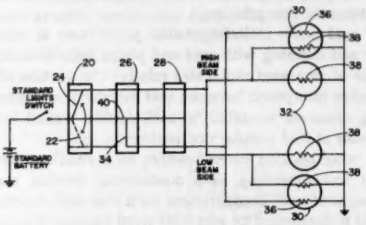
(b) means for supplying an input wave for each of said pairs of a plurality of selectively controlled, unidirectional current path means; and

(c) means for selectively controlling the conduction states of the unidirectional current path means in each pair.

4,105,898
MULTI-BEAM LIGHT SWITCH

Buist A. Farler, 568 Brewer Dr., Nashville, Tenn. 37211, and Billy F. Vanderpool, 112 Fairway Dr., Nashville, Tenn. 37214

Filed Sep. 19, 1975, Ser. No. 614,970
Int. Cl.[2] B62D 45/00; H02G 3/00
U.S. Cl. 307—10 LS 5 Claims



1. An improved headlight system for motor vehicles having at least two sealed beam headlamps providing high and low beam illumination, a floor dimmer switch having at least two operable positions, energizing circuit means connected to said high beam in one position of said switch or said low beam in another position of said switch, wherein the improvement comprises:

(a) an adaptor having a body of insulating material;

(b) means on said body connecting said floor dimmer switch thereto;

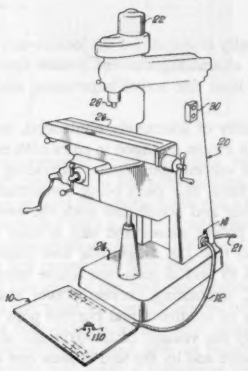
(c) means on said body connecting said energizing circuit means thereto; and

(d) means in said body connecting said floor dimmer switch and said energizing circuit means to illuminate the low beam in one position of said floor dimmer switch and to illuminate both the high and low beams simultaneously in another position of said floor dimmer switch.

4,105,899
SAFETY MAT SWITCH FOR MACHINE TOOLS AND THEIR LIKE

Joseph M. Velosa, 515 N. Lone Hill, San Dimas, Calif. 91773

Filed Jan. 12, 1977, Ser. No. 758,508
Int. Cl.[2] H01H 3/14
U.S. Cl. 307—115 8 Claims



1. A safety device for a machine equipped with an electrically operated primary controller for the prime mover thereof, comprising:

a mat switch, including electrical switching elements reciprocable between an open and a closed position, with said closed position attained upon the sensing of the weight of an operator on the mat, and the open position regained upon the removal of such weight,

quick-disconnect connector means, with a socket affixed to said machine and a plug electrically interconnected with said switching elements by means of insulated conductors passing through a flexible cable,

a source of low-voltage electrical current,

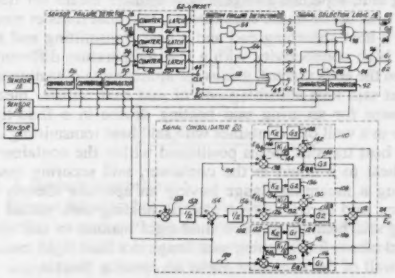
a relay-operated, normally open, control switch, with the coil thereof electrically interconnected with said source through said connector means and said mat switch, and

conductor means, operatively interconnecting said primary controller with the normally open switch contacts of said control switch, whereby said primary controller is energized while the switching elements of said mat switch remain in the closed condition during the presence of the operator on the mat, with said socket and said plug conductively engaged in said connector means.

4,105,900
SIGNAL SELECTION APPARATUS FOR REDUNDANT SIGNAL SOURCES

Donald L. Martin, Bellevue, and David B. Yanke, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 16, 1977, Ser. No. 769,395
Int. Cl.[2] H03K 17/00; G05B 9/03
U.S. Cl. 307—219 16 Claims



1. Signal selection apparatus for supplying an output signal derived from a plurality of redundant signals supplied by a plurality of signal sources, each of said redundant signals representing substantially identical information with one of said signal sources being a precision signal source supplying more precise signal information than the remaining ones of said signal sources, said signal selection apparatus comprising:

signal selection means responsive to a signal source failure signal associated with each of said signal sources, each of said signal source failure signals indicating when the signal source associated therewith is operational and indicating when the signal source associated therewith operates in a failure state, said signal source selection means further responsive to said plurality of redundant signals, said signal source selection means including logic means for comparing said more precise signal supplied by said precision signal source with the signals supplied by the remaining signal sources, said logic means including means for supplying a first selection signal having a first predetermined value when the magnitude of said more precise signal exceeds the magnitude of each of the redundant signals supplied by said remaining signal sources by a first predetermined amount and having a second predetermined value when the magnitude of said more precise signal does not exceed the magnitude of each of said redundant signals supplied by said remaining signal sources by said first predetermined amount, said logic means further including means for supplying a second selection signal when said first selection signal is of said second predetermined value and said failure signal associ-

ated with said precision signal source indicates said precision signal source is operational; and

signal consolidation means responsive to said redundant signals and responsive to said first and second selection signals for supplying said output signal, said signal consolidation means including means for supplying said more precise signal as said output signal when said signal selection means supplies said second selection signal, said signal consolidation means including means responsive to said signal source failure signal associated with said precision signal source for supplying said output signal as a mathematically weighted average of said signals supplied by said remaining signal sources whenever said signal source failure signal associated with said precision signal source indicates said precision signal source is operating in said failure state, said signal consolidation means further including means responsive to said first selection signal for supplying said output signal as a mathematically weighted average of at least said signals supplied by said remaining signal sources whenever said first selection signal is said first predetermined value.

4,105,901
MONOSTABLE CIRCUIT

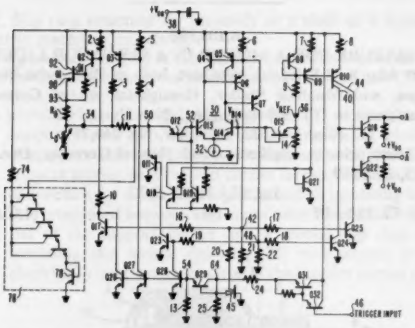
Arthur John Leidich, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 9, 1977, Ser. No. 795,140

Claims priority, application United Kingdom, May 21, 1976, 21208/76

Int. Cl.² H03K *3/284*

U.S. Cl. 307—273 **10 Claims**



1. In combination:

a comparator having first and second input terminals, said first terminal receptive of a voltage at a reference level and said second terminal for receiving a signal voltage which is to be compared with the reference voltage, said comparator having an output terminal and producing at said output terminal a voltage at one level when the voltage at said first terminal is greater than that at said second terminal and a voltage at a second level when the voltage at said first terminal is less than that at said second terminal;

means for applying to said second terminal a signal voltage which initially is at a level lower than said reference level, which then increases in amplitude to a level higher than said reference level, which then again reduces in amplitude to a level lower than said reference level, and which later abruptly increases in amplitude to a level which tends to exceed said reference level; and

means for conditioning said circuit, when said signal voltage reduces in amplitude to a level lower than said reference level, to respond to said tendency of said signal voltage later abruptly to increase in amplitude to a level which exceeds said reference level, for clamping said second terminal to a voltage lower than said reference level.

4,105,902
TOUCH SENSITIVE INPUT FOR ELECTRONIC WRISTWATCH AND/OR ELECTRONIC CALCULATOR

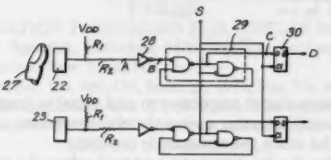
Yuichiro Iwai; Akio Shimoi, and Yoshikazu Kawamura, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Oct. 8, 1976, Ser. No. 730,763

Claims priority, application Japan, Oct. 8, 1975, 50-121591; Oct. 17, 1975, 50-125021; Dec. 1, 1975, 50-143505

Int. Cl.² H03K *3/26;* G08B *21/00;* G04C *3/00*

U.S. Cl. 307—308 **11 Claims**



1. A touch sensitive input for an electronic utilization device comprising a voltage source referenced to a first potential, touch sensitive contact means, said touch sensitive contact means including a conductive resistive contact member for connection to ground through the skin resistance of a user upon engagement thereof by the user; and detector circuit means including a C-MOS inverter input stage having an input to which said touch sensitive contact member is connected and an output, a resistor coupled intermediate said voltage source and said C-MOS inverter stage input, said resistor being selected to have a value substantially greater than the value of the average skin resistance of a likely user so that the input of said inverter stage of said detector circuit means is normally referenced to said first potential for producing a detector circuit output signal representative of said first potential, said touch sensitive contact means selectively referencing said detector circuit means input to a second potential in response to engagement of said touch sensitive contact member to ground through the skin resistance of a user, said detector circuit means producing at its output a detector circuit output signal representative of the second potential in response to application of said second potential to the input thereof.

4,105,903
SAFETY LID INTERLOCK CIRCUIT FOR CENTRIFUGES

Gustavus W. Shaw, Havertown, and Raymond P. Walker, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 750,032

Int. Cl.² H01H *83/00*

U.S. Cl. 307—328 **5 Claims**

1. In a centrifuge of the type having a housing retaining a lid in a closed position and an armature having brushes operatively connected to the rotating portions of the centrifuge, the improved combination comprising:

a. a latch mounted on the housing;

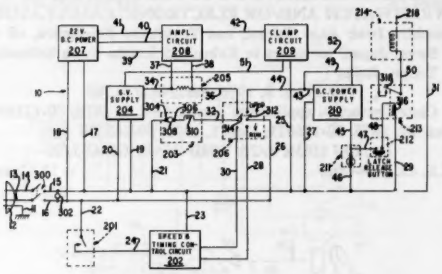
b. an enclosure mounted on the housing and adapted to surround the latch and render it tamper-proof in the closed position;

c. a solenoid mounted on the housing and having a plunger and a spring to push said plunger into engagement with said latch when said solenoid is not actuated thereby preventing opening of said lid;

d. means to actuate said solenoid thereby moving said plunger out of engagement with said latch and permitting opening of said lid;

e. means to supply a current through the brushes of the armature;

f. means to detect a signal and a signal so detected proportional to variations in the current flow through said brushes caused by rotation of the armature;


22 V. D.C. POWER 207
AMPL. CIRCUIT 208
CLAMP CIRCUIT 209
D.C. POWER SUPPLY 204
D.C. POWER SUPPLY 210
SPEED & TIMING CONTROL CIRCUIT 202

g. a clamp circuit responsive to said signal to inactivate said solenoid actuating means thereby preventing opening of the lid when the armature is rotating,

whereby the lid may not be opened when the armature is rotating regardless of whether the power is on or off.

4,105,904

ELECTROMAGNETIC ACTUATORS

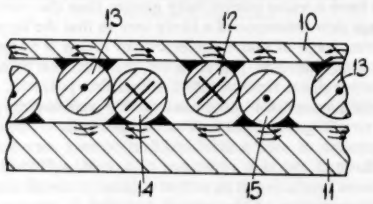
Alec Harry Seilly, North Wembley, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 27, 1976, Ser. No. 754,409

Claims priority, application United Kingdom, Jan. 22, 1976, 2523/76

Int. Cl.² H02K *33/12*

U.S. Cl. 310—27 **7 Claims**



1. An electromagnetic actuator comprising first and second relatively movable non-magnetic support members, said members each having a surface which is presented to but spaced from the surface of the other member, electrical conductors mounted on said surfaces respectively, each of said conductors defining a portion which partially overlaps and is disposed in side by side relationship with the portion defined by the other conductor so that when electric current is passed through the conductors the magnetic fields generated about said portions of the conductors interact to cause attraction or repulsion of said conductors depending on the directtion of current flow in the conductors.

4,105,905

AUXILIARY COOLING DEVICE

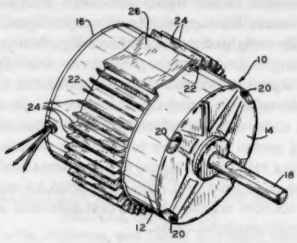
Victor D. Barcus, Churubusco, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jan. 8, 1975, Ser. No. 539,583

Int. Cl.² H02K *9/00*

U.S. Cl. 310—59 **5 Claims**

1. An assembly comprising a dynamoelectric machine including a stationary structure having a finished outer peripheral surface, and a cooling arrangement assembled on the finished outer peripheral surface without press fitting or preheating, the cooling arrangement comprising: a first cooling member and at least a second cooling member positioned adjacent to the outer peripheral surface of the dynamoelectric machine; the first cooling member and the at least a second cooling member each having a plurality of projections extending radially away from the outer peripheral surface to establish cooling fins; and at least two locking members to retain the first cooling member and the at least a second cooling member



in a predetermined axial position on the dynamoelectric machine; the cooling arrangement being capable of assembly on the finished outer peripheral surface of the dynamoelectric machine without defacing the finished outer peripheral surface, and the locking members permitting thermal expansion of the first and second cooling members in a circumferential direction around the outer peripheral surface while maintaining the cooling arrangement under hoop tension on the outer peripheral surface.

4,105,906

ARMATURE FOR A MOTOR IN A PUMP FOR LIQUIDS

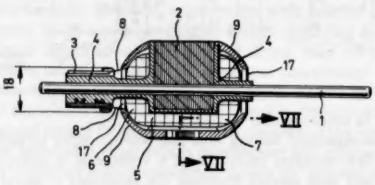
Rolf Ade; Karl-Friedrich Schubert, both of Bietigheim-Bissingen, and Manfred Staller, Hessigheim, all of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,767

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1975, 2555529

Int. Cl.² H02K *5/12*

U.S. Cl. 310—87 **4 Claims**



1. An armature for a motor in a pump for liquids comprising, in combination:

an armature shaft;

a plurality of armature plates mounted on said shaft and having a plurality of radially extending winding slots therein, said plates being concentrically arranged about said shaft to provide a core having a plurality of longitudinally extending grooves formed by the walls of said slots;

an armature coil wound between said plates within said grooves and forming oppositely extending coil ends disposed about said shaft;

first and second symmetrical end covers respectively disposed on opposite ends of said shaft and enclosing said coil ends, each of said covers having a plurality of circumferentially spaced and longitudinally extending webs respectively received in said grooves, wherein the circumferential width of the radially outer portion of each of said webs

is significantly less than the corresponding width of said groove and wherein said covers are circumferentially offset relative to one another so that said webs axially overlap one another in side by side nesting relationship therebetween; and,

wherein each of said webs includes means for respectively interlocking said webs within said grooves.

4,105,907

SLIP RING STRUCTURE FOR DYNAMO ELECTRIC MACHINES, PARTICULARLY AUTOMOTIVE-TYPE ALTERNATORS

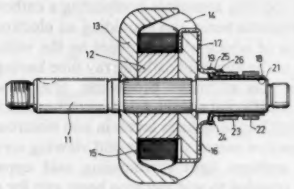
Walter Hagenlocher, Stuttgart; Karl-Heinz Neumann, Warmbronn; Martin Müller, Ludwigsburg; Karl Kleebaur, Allmersbach; Günter Sokol, Esslingen, and Jürgen Molt, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 25, 1976, Ser. No. 717,529

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1975, 2539091

Int. Cl.² H02K *39/08*

U.S. Cl. 310—232 **12 Claims**



1. Slip ring structure for assembly to a shaft of a dynamo electric machine comprising

a support carrier (18) of electrically conductive material and having a circular cross section secured to the shaft (11) of the machine;

a plurality of cylindrical slip rings (22, 23) secured to the support carrier (18), one of said slip rings being attached directly to the electrically conductive material (18) of the support carrier, said support carrier forming one electrical connection for a first slip ring (22), and an insulating layer (21) interposed between said electrically conductive material of the support carrier and a second slip ring (23) insulating said second slip ring (23) with respect to the electrically conductive material of the support carrier (18).

4,105,908

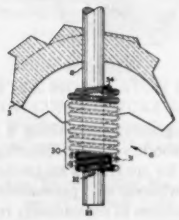
METAL HALIDE LAMP HAVING OPEN TUNGSTEN COIL ELECTRODES

Thomas J. Harding, Aurora, and Wayne R. Hellman, Twinsburg, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 30, 1976, Ser. No. 681,790

Int. Cl.² H01J *61/068, 61/18*

U.S. Cl. 313—217 **10 Claims**



1. An arc tube for a metal halide lamp comprising a light-transmitting envelope having electrodes sealed into opposite ends and containing an ionizable fill including metal halide, thorium within said envelope, one of said electrodes comprising a tungsten shank of a size adequate in current-carrying capacity for said lamp projecting into said envelope and an open tungsten wire coil wrapped around the distal end of said shank and spaced from its tip, said coil being made of a composite tungsten wire comprising primary turns of an overwind wire of not more than 4 mils wrapped snugly around a mandrel wire of not more than 5 mils at a winding pitch leaving gaps between turns of at least about the same width as the overwind wire, the composite wire being substantially closewound on the shank into secondary turns and said coil comprising at least two layers of said secondary turns.

4,105,909

PENETRATION PHOSPHORS FOR DISPLAY DEVICES

Stanley F. Ignasiak, Holliston, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

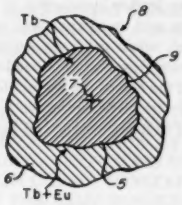
Division of Ser. No. 669,426, Mar. 22, 1976, Pat. No. 4,071,640.

This application Oct. 27, 1977, Ser. No. 845,995

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.² H01J *29/20, 29/28, 31/20*

U.S. Cl. 313—473 **6 Claims**



1. A cathodo-luminescent particle for use in an electron tube comprising:

a central region consisting of La_2O_2S with Tb_2O_2S uniformly distributed therethrough which produces a green, narrow-bandwidth emission upon electron excitation thereof, and

a peripheral region surrounding said central region and comprised of $La_2O_2SO_4$ with a distribution of $Tb_2O_2SO_4$ therethrough for providing a barrier layer with respect to said central region which must be penetrated by said electrons before substantial emission emanates from said central region and wherein the concentrations of Tb_2O_2S and $Tb_2O_2SO_4$ are substantially smaller than the respective concentrations of La_2O_2S and $La_2O_2SO_4$.

4,105,910

FLUORESCENT LAMP WITH AN INTEGRAL FAIL-SAFE AND AUXILIARY-AMALGAM COMPONENT

George S. Evans, Caldwell, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 23, 1976, Ser. No. 679,598

Int. Cl.² H01J *61/28, 61/42*

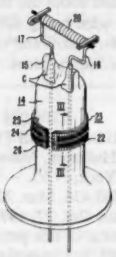
U.S. Cl. 313—490 **7 Claims**

6. In a low-pressure type electric discharge lamp having a sealed light-transmitting envelope that contains spaced thermionic electrodes and an ionizable medium including mercury and has a re-entrant wall portion with an associated pair of lead-in conductors which are sealed through said wall portion and protrude therefrom into the envelope and are connected to one of said electrodes,

integral means for rapidly providing mercury vapor within the lamp under cold-start conditions and, at the end of the useful life of said lamp, automatically initiating its failure

in a safe manner, said means comprising an adherent coating which is disposed on the inner surface of the re-entrant wall portion of said envelope and contains (a) a metal that combines with some of the mercury within the lamp to form an amalgam, and (b) an additive which renders the coating semiconductive, as formed,

said coating being located on a part of the re-entrant wall portion of said envelope that is proximate to a sealed-in segment of at least one of said lead-in conductors and is



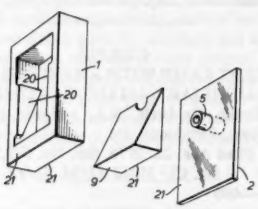
adjacent to the associated electrode, and said coating also extending into overlapping and contacting relationship with said one lead-in conductor at the point where it emerges from said re-entrant wall portion and thereby being adapted, when rendered conductive by sputtered metallic deposits from the associated electrode and lead-in conductors at the end of the useful life of the lamp, to then provide an electrically-conductive path along a predetermined part of said re-entrant wall portion.

4,105,911

TRAVELLING WAVE TUBES

Robin Charles Moorhouse King, and Maurice Esterson, both of Chelmsford, England, assignors to English Electric Valve Company Limited, England

Filed Nov. 30, 1976, Ser. No. 746,123
Int. Cl.² H01J *25/34*
U.S. Cl. 315—3.5 **8 Claims**



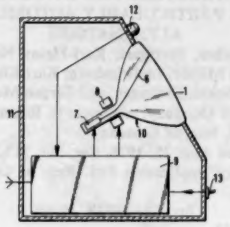
1. A coupled cavity travelling wave tube having a sever which includes a termination wedge, a sever pole piece, a drift tube in said pole piece and a termination cavity member defining a rectangular waveguide, said rectangular waveguide having an inner surface which bears projections, which projections are shaped and dimensioned to engage with said termination wedge whereby said termination wedge is sandwiched between said projections and said sever pole piece.

4,105,912

RADAR VIEWING DEVICE

Hans-Jurgen Senger, Norderstedt, Fed. Rep. of Germany, assignor to Elna, GmbH, Rellingen, Fed. Rep. of Germany

Filed May 11, 1976, Ser. No. 684,404
Claims priority, application Fed. Rep. of Germany, May 7, 1976, 2520505
Int. Cl.² 343 *6 TV*; H01J *31/26*
U.S. Cl. 315—10 **5 Claims**



1. A radar viewing apparatus comprising a cathode ray tube housing an electron beam gun providing an electron beam the characteristics of which are dependent on the voltage applied to the anode of the gun, said cathode ray tube having a viewing screen and a pair of image producing, afterglowing layers luminescing in different colors, said layers luminescing responsive to different anode voltage levels in said electron beam gun; and photosensitive means adjacent said viewing screen responsive to the ambient light surrounding said apparatus, said means being coupled to said electron beam gun for altering the anode voltage of said gun and the color of the image on said screen responsive to ambient light levels.

4,105,913

CORE MAGNETRON AND METHOD OF MANUFACTURING PERMANENT MAGNETS THEREFOR WITH LOW GAS EMISSION

Masaru Yamano, Hirakata, and Toshio Iemura, Kyoto, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jul. 20, 1976, Ser. No. 707,010
Claims priority, application Japan, Aug. 11, 1975, 50-111250
Int. Cl.² H01J *25/50*
U.S. Cl. 315—39.71 **17 Claims**

1. A core type magnetron comprising a vacuum envelope including a cathode, anode vanes surrounding said cathode and a permanent magnet for applying a magnetic field in the vicinity of said cathode, wherein said permanent magnet has been manufactured by a process to substantially reduce the emission of gases from said permanent magnet when the magnetron is operating including; the steps of melting source materials as required for a hard magnet having high retentivity in a vacuum

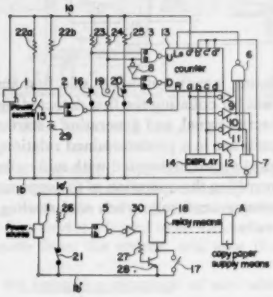
at an elevated temperature of more than 1300° C, casting the melt in a vacuum, and thereafter hot forging the same at another elevated temperature before finishing with conventional known steps.

4,105,914

PRESETTING COUNTER DEVICE

Tomoji Murata, Toyokawa; Kenji Shibazaki, Aichi; Yoshihiro Nakamura, and Matsuo Kuse, both of Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 669,452, Mar. 22, 1976, abandoned. This application Jun. 21, 1977, Ser. No. 808,773
Claims priority, application Japan, Apr. 1, 1975, 50/44291
Int. Cl.[2] G06B *27/06*; G06M *3/04*
U.S. Cl. 235—92 SB **12 Claims**



1. A presettable counter device for use in a mechanical apparatus comprising:

an electrical power supply to be connected with said apparatus, an up-down counter means coupled to said power supply and able to store numerical information, the content of which counter means is incremented to a predetermined number in order to set operational times for said mechanical apparatus and decremented by "1" for each input signal produced according to the operation of said mechanical apparatus;

a display means coupled to said counter means for indicating the content of said counter means as a decimal representation thereof;

a reset means coupled to said counter means and actuable to set the content of said counter means to "1";

operation start means for starting operation of said mechanical apparatus to initiate decrementation of said numerical information stored in said counter means;

an actuation means coupled to said counter means and said mechanical apparatus for stopping continuous operations of said mechanical apparatus and for setting the content of said counter means to "1" when one cycle of operation has been performed after the content of said counter means becomes "1"; and

a set means coupled to said counter means for setting the content of said counter to "1" when said mechanical apparatus is initially connected with said power supply after having been disconnected from the power supply.

4,105,915

DEFLECTION-TYPE MODULATOR OF LASER BEAM FOR COMMUNICATIONS

Burton Ross Clay, Wayland, and Douglas Alan Gore, Billerica, both of Mass., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 19, 1976, Ser. No. 715,859
Int. Cl.[2] H04R *1/44*
U.S. Cl. 250—199 **1 Claim**

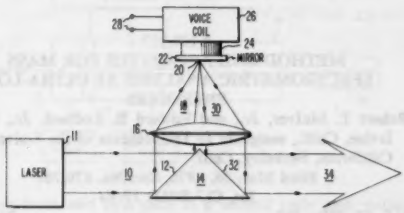
1. Means to transmit intelligence from a local point to a remote point, comprising

a lens,

a right-angle prism disposed in proximity with said lens,

a mirror normally spaced the focal length distance from said lens,

a laser directing a light beam to said prism for reflection at a right-angle through half of said lens to said mirror, and back through the other half of the lens to the prism for reflection at a right-angle to the remote point,



an electromechanical transducer connected with said mirror to reciprocate it toward and away from said lens to deflect the beam in accordance with intelligence, and

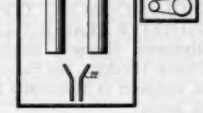
two photosensors at the remote point positioned in spaced relation so that the light beam from the laser at the local point normally passes between photosensors, and is deflected back and forth between said photosensors when the mirror is reciprocated.

4,105,916

METHODS AND APPARATUS FOR SIMULTANEOUSLY PRODUCING AND ELECTRONICALLY SEPARATING THE CHEMICAL IONIZATION MASS SPECTRUM AND THE ELECTRON IMPACT IONIZATION MASS SPECTRUM OF THE SAME SAMPLE MATERIAL

Melvin W. Siegel, Pittsburgh, Pa., assignor to Extranuclear Laboratories, Inc., Pittsburgh, Pa.

Filed Feb. 28, 1977, Ser. No. 772,905
Int. Cl.[2] H01J *37/08*
U.S. Cl. 250—282 **44 Claims**



1. A method for simultaneously producing and electronically separating a chemical ionization mass spectrum and an electron impact ionization mass spectrum of the same sample material, the method comprising the steps of:

placing a chemical ionization enclosure and an electron ionization space in tandem proximate the entrance of a mass spectrometer with said space interposed between the outlet of said enclosure and said entrance;

introducing the same sample material in said enclosure and said space;

ionizing said sample material in said enclosure and said space;

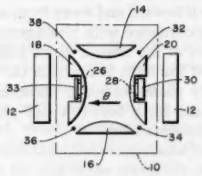
alternately electronically suppressing ions from discharging from said enclosure and from said space for receipt by said mass spectrometer by changing the potential surrounding said space alternately above and below the potential of said enclosure;

filtering and detecting the charge of said ions alternately received from said enclosure and said space by said mass spectrometer, and separating signals detected from said enclosure from those alternately received from said space and registering said signals separately.

4,105,917
METHOD AND APPARATUS FOR MASS SPECTROMETRIC ANALYSIS AT ULTRA-LOW PRESSURES

Robert T. McIver, Jr., and Edward B. Ledford, Jr., both of Irvine, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 26, 1976, Ser. No. 670,767
Int. Cl.² B01D *59/44*
U.S. Cl. 250—291 **21 Claims**



1. In an ion cyclotron resonance mass spectrometer analyzer cell in which ions are formed from a sample during an ionizing period the improvement comprising:

magnetic means for producing a constant, substantially homogeneous magnetic field in said cell;

a first set of electrodes for producing a quadrupolar electrostatic field in said cell which prevents the escape of ions from said cell in the direction parallel to the magnetic field;

a second set of electrodes for producing an electrostatic field to prevent the drift of ions out of the ends of the analyzer cell in a direction perpendicular to the magnetic field;

irradiation means for irradiating said cell with an alternating electric field to excite and accelerate ions of selected mass-to-charge ratios; and

sensing means for detecting ions which have been selectively accelerated by the alternating electric field.

4,105,918
THERMOLUMINESCENT TYPE RADIATION DOSIMETER READOUT APPARATUS

Katsuhiko Miyagawa; Hidenori Kunishige, both of Osaka; Hirotaka Otsuka, Hirakata, and Fusafumi Nakao, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 28, 1976, Ser. No. 727,699
Claims priority, application Japan, Sep. 30, 1975, 50/118537
Int. Cl.² G01T *1/115*
U.S. Cl. 250—337 **5 Claims**

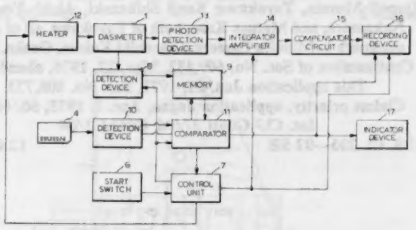
1. A thermoluminescent type radiation dosimeter readout apparatus comprising:

means to hold a thermoluminescent type radiation dosimeter, means for heating the dosimeter held by said holding means, means for measuring the thermoluminant rays emitted from the heated dosimeter;

a first detecting means associated with said dosimeter holding means for detecting indicia on the held dosimeter and producing a first signal corresponding thereto;

a card holding means for receiving a personal identification card having indicia thereon and retaining it at a predetermined position;

a second detecting means associated with said card holding means for detecting the indicia on the received personal identification card and producing a second signal corresponding thereto;



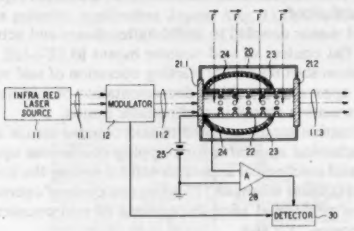
a collating means coupled to said first and second detecting means for collating the first detected signal and the second detected signal, and generating a starting signal when said signals are in a predetermined relation; and

a control means connected with said collating means and for controlling the operation of the apparatus for carrying out a measurment only when said starting signal is supplied thereto.

4,105,919
SPECTROPHONE WITH FIELD TUNING OF ABSORPTION CELL

Thomas James Bridges, Holmdel, and Ernest Gardner Burkhardt, Wall, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 25, 1977, Ser. No. 790,460
Int. Cl.² G01J *1/00, 3/42*
U.S. Cl. 250—341 **11 Claims**



1. In combination:

(a) an optical absorption cell containing a gas medium to be analyzed for an impurity;

(b) means for forming a modulated beam of optical radiation containing a first optical wavelength, said beam modulated at a first acoustic frequency, in order to form a modulated optical beam incident on the absorption cell;

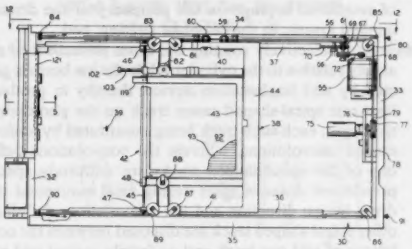
(c) means for producing a static field in the gas medium having a field strength suitable for increasing the absorption by the impurity in the gas medium of energy at said first wavelength from the modulated beam; and

(d) means, coupled to said gas medium, for detecting the pressure variations at said acoustic frequency of said gas medium in response to the said beam in the presence of said static field.

4,105,920
X-RAY SPOT FILM DEVICE

Thomas Pury, Brookfield; Floyd L. Gray, Hales Corners; Marvin L. Sivertsen, Milwaukee; Robert L. Konle, New Berlin, and Richard E. Stehr, Hartland, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,574
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—402 **10 Claims**



3. For use with a diagnositic x-ray table including a table body, an x-ray source in the body and a table top for supporting an examination subject in the path of an x-ray beam from the source, a spot film device adapted to be located on a side of the table top remote from the source, said spot film device comprising:

support means for extending crosswise of said table top,

carriage means mounted for translating on said support means between an inactive position and an active radiographic position,

means for holding a radiographic cassette on said carriage means,

mask means mounted on said support means for being translated crosswise of said table top selectively into and out of the path of the beam from said x-ray source, said mask means having an aperture for defining the beam impinging on a cassette in said means for holding a cassette,

reversible motor means,

drive pulley means driven by said motor means,

idler pulley means spaced from said drive pulley means, belt means translating said mask means and running on said drive pulley and idler pulley means, said belt means having opposite end portions connected to said mask means,

stop means for limiting the movement of said mask means,

said belt means having an elastic characteristic for enabling said belt means to yield and absorb shock and allow overtravel by said motor means when said mask means is stopped abruptly by said stop means,

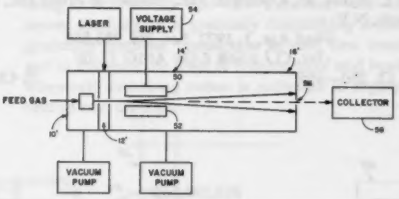
means responding to said mask means reaching a position near said stop means by reducing the electric power supplied to said servo motor means and then maintaining said reduced power for holding said mask means against said stop means.

4,105,921
ISOTOPE SEPARATION

Rodney J. Bartlett, and John R. Morrey, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 28, 1976, Ser. No. 727,560
Int. Cl.[2] H01J *27/00*
U.S. Cl. 250—423 P **8 Claims**

1. A method for separating molecules of a gas containing a first isotope of an element from molecules of the same gas containing a second isotope of said element, all of said molecules being at the same initial electronic state, wherein said molecules are not decomposed nor ionized during said separating, comprising continuously flowing a stream of gas molecules containing said first and second isotopes along a first path, continuously selectively exciting gas molecules in said stream containing one of said isotopes to a different electronic state; continuously flowing said stream containing said excited and non-excited gas molecules through an inhomogeneous deflecting field, continuously deflecting by said inhomogeneous deflecting field the gas molecules containing one of said

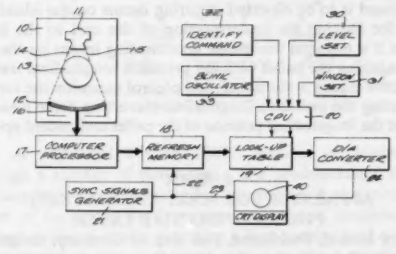


isotopes from said first path to a second path; and, without further excitation, continuously collecting gas molecules containing one of said isotopes traveling along one of said paths, wherein said collected gas molecules are of the same composition as the gas molecules before said exciting to a different electronic state.

4,105,922
CT NUMBER IDENTIFIER IN A COMPUTED TOMOGRAPHY SYSTEM

Thomas W. Lambert, Dousman, and James Edward Blake, New Berlin, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,528
Int. Cl.[2] A61B *6/02*; G01N *23/08*
U.S. Cl. 250—495 T **5 Claims**



1. In a computed tomography system including means for producing first electric signals having a large range of values corresponding respectively with the X-ray attenuation and CT numbers of volume elements in a layer of a body; a memory matrix for storing said signals; display means for displaying a visual image depending on said stored signals comprising an intensity modulatable scanning cathode ray tube and means for modulating the intensity of said tube in correspondence with the values of successive signals; means for selecting from said large range of signal values signals lying within a window comprised of a smaller range of values defined by upper and lower limits and a level value centered between said limits; means for converting said signals within said window to signals for modulating said cathode ray tube; and, improved means for identifying the CT numbers corresponding with selected zones in said displayed image comprising:

means for selecting signals in a narrow band corresponding substantially with the CT number values of said level within the selected window;

means for activating said selecting means; and

means for causing said selected signals to modulate only those zones in said displayed image which have CT numbers corresponding substantially with said selected level

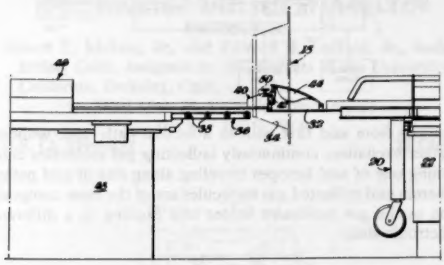
to an intensity corresponding with said level and alternately in quick succession to higher intensity whereby to enable identification of the CT numbers.

4,105,923

PATIENT HANDLING SYSTEM AND APPARATUS FOR TOMOGRAPHIC SCANNING

John L. Hynes, Jr., Columbia, Md., assignor to Pfizer Inc., New York, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,556
Int. Cl.² A61B 6/04; A61G 13/00
U.S. Cl. 250—456 **21 Claims**



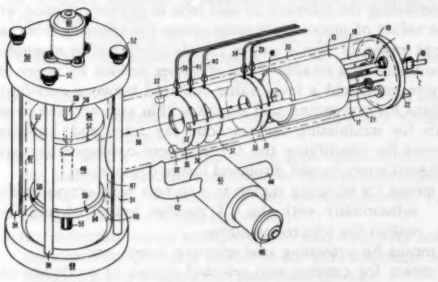
15. An apparatus for handling patients to be X-rayed on a tomographic scanner having a vertically-adjustable island having precision longitudinally-traversing drive means disposed adjacent the scanner comprising a cart for of transporting the patient to and from the island, the cart having a longitudinally movable patient-supporting pallet section, an under-portion of the cart being constructed and arranged for disposition over the island when the island is disposed in its lowest position, the under-portion being constructed and arranged for engaging the island with the under-portion of the cart when the island is to be elevated, securing means on the island and cart for locking the under-portion of the cart to the island when it is engaged therewith, coordinating means on the cart for engaging the pallet with the precision longitudinal traversing drive means in the island, and control means on the cart for operating the precision longitudinal-traversing drive means to adjust the longitudinal position of the pallet and patient upon it.

4,105,924

APPARATUS FOR MAKING A RASTERED PHOTOCONDUCTIVE LAYER

Holger Hinkel, Boeblingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1976, Ser. No. 741,083
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557685
Int. Cl.² H01J 37/00
U.S. Cl. 250—492 A **3 Claims**



1. Apparatus for providing a rastered photoconductive layer on a selenium-coated photoconductor drum for achieving an improved representation of black areas, said apparatus comprising

housing means including a transparent vacuum-sealed cylinder that has an axial length substantially longer than that of the drum,

spindle means carried by said housing means and extending coaxially into the cylinder and into screw-threaded engagement with said drum,

an ion implantation device mounted to project an ion beam of arsenic to impinge on the periphery of the drum and implant arsenic in the selenium coating, and

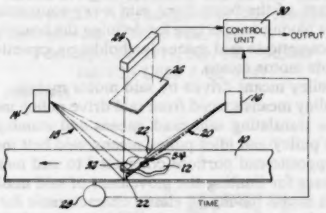
means for selectively rotating the drum to cause it to move axially relative to the cylinder while the ion beam is generated by said implantation device, thereby to produce at least one spiral-shaped raster track on the photoconductive layer, each such track being constituted by uniformly spaced convolutions, wherein the convolutions defining one of the spiral-shaped tracks are uniformly spaced a preselected distance apart during axial movement of the drum in one direction and the convolutions defining another spiral-shaped track are disposed between the convolutions of said one track and uniformly spaced said preselected distance apart during movement of the drum in the opposite direction.

4,105,925

OPTICAL OBJECT LOCATOR

Lothar Rossol, Sterling Heights; Joseph T. Olsztyn, Madison Heights; Robert Dewar, Warren, and Steven W. Holland, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 14, 1977, Ser. No. 777,011
Int. Cl.² G01N 21/30
U.S. Cl. 250—561 **2 Claims**



1. An electro optical locator device for determining the position of an object on a conveyor comprising

first and second light sources fixed in space above the said conveyor and emitting light in sheet form in first and second planes defining a dihedral angle with its apex substantially on the conveyor transverse to the movement thereof and each plane being at an acute angle in relation to the conveyor for projecting onto the conveyor a single line of light transverse to the conveyor motion, wherein an object carried by the conveyor intercepts the light above the surface of the conveyor at positions laterally spaced from the apex of the dihedral angle so that the single line of light is projected onto the conveyor only outside the boundaries of the said object,

a linear photosensor array of photo elements responsive to light in a plane perpendicular to the conveyor aligned with the apex of the dihedral angle for viewing the single line of light projected onto the conveyor outside an object boundary, the illumination of individual photo elements being dependent on the position of the boundaries of the object with respect to the conveyor and

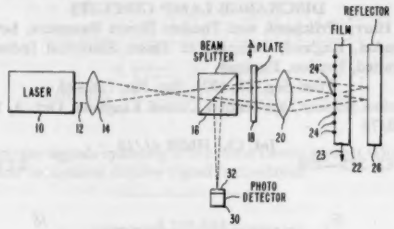
means responsive to the respective photosensor elements effective to determine the pattern of illumination of said

photosensor array at a particular conveyor position to determine the position of the boundaries of the object relative to the conveyor.

4,105,926
ON-AXIS FILM SCANNER WITH REFLECTED ILLUMINATION

Charles William Reno, Haddonfield, and Donald George Herzog, Collingswood, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,869
Int. Cl.² G06K 7/10
U.S. Cl. 250—566 **11 Claims**



1. Apparatus for reading indicia elements on transparent film, comprising

a source of a light beam,

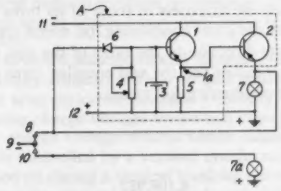
a reflector, and

means to direct said light beam from said source through said film to said reflector, and back to a point on said film, said beam when initially passing through said film having a much larger cross sectional dimension than indicia elements on the film and much larger than it is when returned back to said point on said film.

4,105,927
DEVICE FOR ADJUSTING THE LEVEL OF BRIGHTNESS EMITTED BY A LAMP

Oscar Wilje, Sturegatan 44, 791 00 Falun, Sweden

Filed Apr. 23, 1976, Ser. No. 679,779
Claims priority, application Sweden, Apr. 24, 1975, 7504725
Int. Cl.² B60Q 1/02
U.S. Cl. 315—82 **8 Claims**



1. A device for causing the brightness of a headlight lamp in a headlamp assembly of a vehicle to diminish gradually during the simultaneous switching from headlight to dimlight, said device comprising:

(a) a headlight and a dimlight;

(b) switching means connected to said headlight and to said dimlight to supply current to said dimlight or to said headlight by alternately connecting said dimlight and said headlight to an electrical potential source; and

(c) control means connected to said headlight and dimlight for causing the brightness of said headlight to diminish gradually upon connection of said potential source by said switching means from headlight to dimlight, said control means comprising:

(i) a first transistor having its base connected to storage means for storing electrical energy,

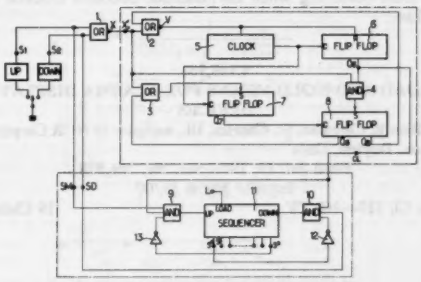
(ii) said switching means being arranged to also supply current to said storage means when supplying current to said headlight, and

(iii) a second transistor connected in series with said headlight for controlling the current flowing through said headlight, the conduction of said second transistor being controlled by said first transistor, said storage means discharging a gradually diminishing current to gradually diminish conduction of said first transistor and to decrease the level of brightness of said headlight when said switching means is activated to supply current to said dimlight.

4,105,928
SEQUENTIAL CONTROL CIRCUIT CAPABLE OF SEQUENCING THROUGH A NUMBER OF STABLE STATES IN A PREDETERMINED ORDER

Gilles Leconte, Rueil-Malmaison, France, assignor to Regie Nationale des Usines Renault, France

Filed Nov. 19, 1976, Ser. No. 743,377
Claims priority, application France, Nov. 21, 1975, 75 35636
Int. Cl.² B60Q 1/08; H03K 17/28
U.S. Cl. 315—82 **22 Claims**



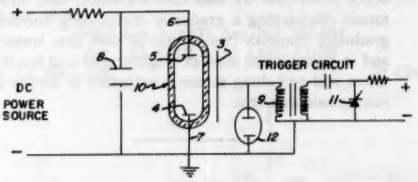
1. A sequential control circuit capable of sequencing through a number of stable states in a predetermined order, starting from a predetermined stable state and sequencing in either of two opposite directions, said circuit comprising a contact maker normally assuming a first position and capable alternatively of assuming either of two transient positions of contact, said contact maker when in one of the transient positions generating a transient signal indicative of the particular transient position assumed; timing means coupled to said contact maker for providing a timer signal in response to generation of a transient signal by said contact maker; and a logic circuit coupled to said contact maker and to said timing means and capable of sequencing through a number of output conditions corresponding with the stable states, said logic circuit, during presence of the timer signal, being responsive to a transient signal to sequence to another output condition, the direction of sequencing of said logic circuit being dependent upon the transient position assumed by said contact maker, said logic circuit including means responsive to initial application of voltage to said logic circuit for setting said logic circuit to a predetermined one of the output conditions.

12. A sequential control circuit as claimed in claim 1, adapted for controlling the outside lighting of an automobile, in which said logic circuit includes a two-position switch having a first position for removing voltage from said logic circuit and a second position for applying voltage to said logic circuit.

4,105,929
SHUNT TRIGGERED FLASHTUBE HAVING SAFETY FEATURE

Robert J. Cosco, Amesbury, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Jun. 30, 1976, Ser. No. 701,381
Int. Cl.[2] H05B *41/30*; H02H *7/20*
U.S. Cl. 315—125 **1 Claim**

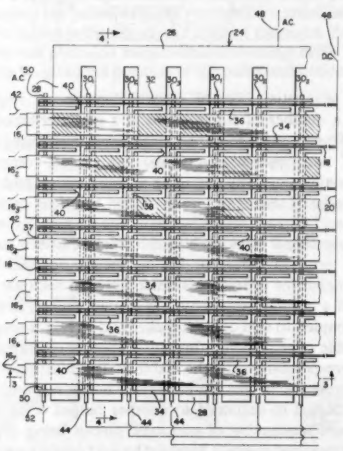


1. In the circuit for a flashtube having an hermetically sealed glass envelope containing an inert gas and a pair of electrodes between which an arc discharge path is defined during lamp operation and having an external trigger wire which is insulated from the ambient atmosphere, the improvement which comprises an enclosed spark gap connected to the trigger wire, the breakdown voltage of the spark gap being higher than that of the normal flashtube but lower than that of the flashtube when air has leaked thereinto, thereby preventing an external arc from occurring when the flashtube becomes cracked or broken.

4,105,930
LOAD AND HOLD MEANS FOR PLASMA DISPLAY DEVICES

William E. Coleman, St. Charles, Ill., assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 19, 1976, Ser. No. 706,578
Int. Cl.[2] H05B *39/00*
U.S. Cl. 315—169 TV **19 Claims**

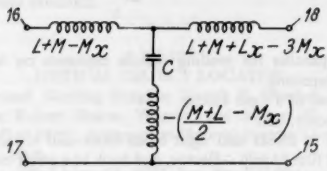


1. In a plasma discharge device of the type having a walled structure containing an ionization medium, electrodes disposed on opposite sides of the walled structure, and means for applying potential differences between adjacent electrodes whereby the medium will emit light proximate the adjacent electrodes, the improvement wherein said electrodes include a first AC electrode on one wall surface, a second AC electrode on an opposed wall surface and crossing the first electrode, and means for developing a DC discharge at selected locations in the vicinity of said first and second electrodes, said DC discharge means including a first DC electrode on one wall surface and a second DC electrode on the opposed wall surface crossing the first DC electrode at a location in the vicinity of the first and second electrodes for developing a DC discharge at the crossing location, said DC discharge, combined with the development of a potential difference between said AC electrodes at the crossing thereof resulting in the ionization of said gas proximate the AC electrode crossing.

4,105,931
INDUCTOR STRUCTURES FOR ELECTRICAL DISCHARGE LAMP CIRCUITS

Eric Harry Pritchard, and Thomas Rivers Passmore, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed Sep. 27, 1976, Ser. No. 726,622
Claims priority, application United Kingdom, Oct. 3, 1975, 40630/75
Int. Cl.[2] H05B *41/16*
U.S. Cl. 315—278 **4 Claims**



1. An inductor structure comprising:
magnetic core means;
a first conducting foils means wound around at least part of the said core means and insulated from the said core means;
a second conducting foil means would around at least part of the said core means and interwound with the said first conducting foil means;
dielectric means separating and insulating said foil means from one another, said first and second foil means being provided with respective different numbers of turns, and that one of the conducting foil means providing the greater number of turns being so wound that those of its turns which are in excess of those of its turns which are equalled by the other conducting foil means are wound in the opposite direction to the turns of the said other conducting foil means and the said equalled turns of the said one of the conducting foil means.

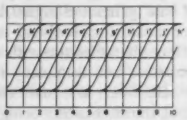
4,105,932
"SLEWED PULSE" SCOPE SWEEP CALIBRATOR

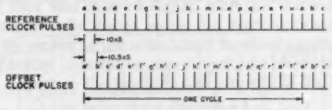
Edward Joseph Cleary, Jr., Beaverton, and Michael Goodwin Reiney, Tigard, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 24, 1976, Ser. No. 744,559
Int. Cl.[2] G01R *13/30*
U.S. Cl. 315—377 **14 Claims**

2. A system for providing sweep rate calibration signals for a display device, comprising:
timing reference means for generating a reference signal having a predetermined frequency; and
means responsive to said reference signal for producing trigger signals and display signals in timed relationship wherein the period of said display signals is greater than the period of said trigger signals by a predetermined inter-

val so that each successive display signal is incrementally delayed with respect to said trigger signals, each of said



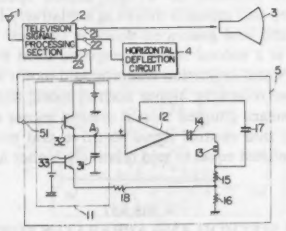


trigger signals initiating a time-base sweep against which a said successive display signal is displayed.

4,105,933
VERTICAL DEFLECTION CIRCUIT

Fumio Inoue, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 28, 1977, Ser. No. 763,665
Claims priority, application Japan, Feb. 2, 1976, 51-9374
Int. Cl.[2] H01J *29/70, 29/72*
U.S. Cl. 315—387 **5 Claims**



1. A vertical deflection circuit comprising:

a capacitor across which a saw-tooth wave voltage is to be generated;

a current source connected to said capacitor for supplying a substantially constant current to said capacitor during a vertical scan period to produce a linearly increasing or decreasing charge voltage across said capacitor;

capacitor charge voltage control means including a switch which is controlled by a vertical synchronizing signal to be turned on during a vertical blanking period and turned off during the vertical scan period, said capacitor charge voltage control means supplying a current to said capacitor during the vertical blanking period to restore the charge voltage of said capacitor from a voltage level corresponding to the end of the vertical scan period to a voltage level corresponding to the start of the vertical scan period;

a vertical deflection coil;

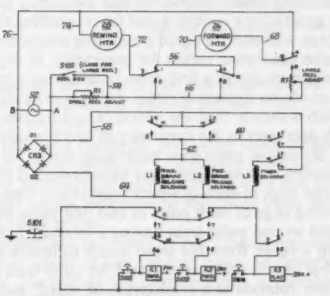
means for amplifying the saw-tooth wave voltage developed across said capacitor to feed a saw-tooth wave current to said vertical deflection coil; and

feedback circuit means connected between said vertical deflection coil and said current source for controlling the current supplied to said capacitor from said current source; said feedback circuit means including detection means coupled to said vertical deflection coil to produce a voltage waveform which is analogous to the saw-tooth wave current and supply means for supplying the voltage produced in said detection means to said current source thereby to control the current magnitude thereof for compensating for non-linearity of said saw-tooth wave current.

4,105,934
MAGNETIC TAPE REPRODUCER WITH SERIES INTERCONNECTED TORQUE MOTORS IN PLAY MODE

John P. Jenkins, Towanda, Ill., assignor to International Tapetronics Corporation, Bloomington, Ill.

Filed Apr. 16, 1976, Ser. No. 677,539
Int. Cl.[2] B65H *77/00*
U.S. Cl. 318—7 **8 Claims**



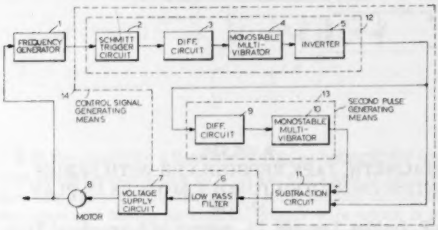
1. In transducing apparatus for a magnetic tape trained between forward and rewind reels for movement past a transducing head and between a rotatable capstan and a pressure roller movable toward and away from the capstan, tape drive means including a capstan motor for rotating the capstan at constant speed and forward and rewind torque motors operating at normal voltage connected to the forward and rewind reels to move the tape in forward and rewind directions respectively, control means including a transducing mode circuit selected to place the apparatus in transducing mode in which both torque motors are simultaneously energized to rotate the reels in opposite directions to tension the tape across the head and the pressure roller is moved to press the tape into frictional speed-limiting driving engagement with the capstan, the control means further including a fast mode circuit selective to place the apparatus in a fast mode in which the pressure roller is moved to free the tape from the capstan while only one of the torque motors is energized at a predetermined voltage to wrap the tape at fast speed onto its corresponding reel while the other torque motor is deenergized to enable the tape to unwrap freely from the other reel, the improvement comprising:

means included in said transducing mode circuit for connecting said torque motors in series across said predetermined voltage to reduce the current through both motors during said transducing mode to limit the tension applied to said tape.

4,105,935
MOTOR SPEED CONTROL APPARATUS

Kazuo Arai; Yoshiaki Igarashi, both of Neyagawa; Masaki Suzuki, Hirakata; Nobuya Sano, Ikoma, and Toshikazu Yosumi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 15, 1976, Ser. No. 733,023
Claims priority, application Japan, Oct. 22, 1975, 50-127819; Oct. 24, 1975, 50-128733
Int. Cl.[2] H02P *5/10*
U.S. Cl. 318—314 7 Claims



1. A motor speed control apparatus comprising: frequency generating means coupled to the motor to be controlled for generating a frequency signal, the frequency of which is proportional to the rotational speed of said motor; and control signal generating means coupled to said frequency generating means for generating a control signal for controlling the torque of said motor, said control signal generating means comprising (a) first pulse generating means for generating, in dependence on said frequency signal, a first pulse train having a period the same as that of said frequency signal, each pulse having a pulse width which is shorter than the period of said frequency signal and which decreases as the frequency of said frequency signal increases; (b) second pulse train generating means for generating in dependence on said frequency signal a second pulse train of pulses, one edge of each of which coincides in time with the corresponding edge of each pulse of said first pulse train, each pulse of said second pulse train having a constant pulse width which is in a range from the same width to nearly the same width as that of said each pulse of said firt pulse train obtained by the motor rotation at a predetermined speed; and (c) subtraction means coupled to said first and second pulse generating means for producing a third pulse train of pulses which is the difference between said first pulse train and said second pulse train, each of which has a pulse width corresponding to the difference between said pulse width of said pulses of said first pulse train and said pulse width of said pulses of said second pulse train and has a first polarity when the pulse width of said pulses of said first pulse train exceeds the pulse width of said pulses of said second pulse train and has an opposite polarity when the pulse width of said pulses of said second pulse train exceeds the pulse width of said pulses of said first pulse train, whereby a motor torque corresponding to said third pulse train can be generated when said third pulse train is supplied to said motor as the driving signal therefor.

4,105,936
VARIABLE SPEED TAPE TRANSPORT APPARATUS

Isao Matsumoto, Tokyo, and Haruhisa Yamaguchi, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 13, 1976, Ser. No. 686,077
Int. Cl.[2] H02P *1/04*
U.S. Cl. 318—328 11 Claims

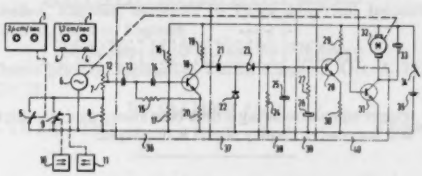
1. A variable speed tape transport apparatus for transporting tape in a cassette at a substantially constant speed, said speed being selected from plural predetermined speeds, comprising:

a variable speed motor for driving said tape;

means responsive to the speed of said motor for generating a signal whose amplitude and frequency both are proportional to said speed so that the generated signal is within a frequency range corresponding to said plural predetermined speeds;

control means for producing a motor speed control signal as a function of said generated signal, said control means including filter means for receiving said generated signal and having a filter characteristic with a rolloff portion that at least encompasses said frequency range of said generated signal to selectively attenuate the amplitude of said generated signal, the attenuation being inversely related to the frequency of said generated signal, said control signal being derived from said selectively attenuated generated signal;

sensing means coupled to said cassette for sensing predetermined speed indications on said cassette, each said indication representing a respective normal tape speed;



level determining means for supplying a selectable level of said generated signal to said filter means;

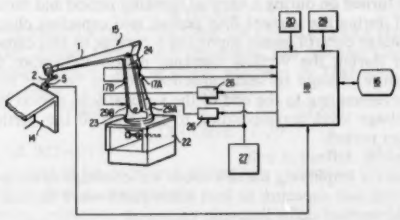
switch means actuable in response to the speed indications sensed by said sensing means for controlling said level determining means to determine the level of said generated signal supplied to said filter means, such that said generated signal is supplied to said filter means at a first level in response to a first sensed speed indication whereby said motor is driven at a relatively lower normal speed and said generated signal is supplied to said filter means at a second level in response to at least a second sensed speed indication whereby said motor is driven at at least one relatively higher normal speed; and

selector means coupled to said control means and operable to vary said control signal to drive said motor at a fast speed at least equal to said relatively higher normal speed.

4,105,937
TEACH-IN METHOD AND APPARATUS FOR USE IN AN INDUSTRIAL ROBOT

Goro Tuda; Katsuhiko Shimizu, both of Kobe; Tudoi Murakami, Ashiya, and Syouzi Nasu, Akashi, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed May 24, 1976, Ser. No. 689,125
Claims priority, application Japan, May 23, 1975, 50-62239; Jan. 9, 1976, 51-2217
Int. Cl.[2] G05B *19/24*
U.S. Cl. 318—568 3 Claims



1. A teach-in method for use in an industrial robot, wherein the teaching is accomplished by manually guiding the tracing tip of a robot arm along a desired path, which method comprises the steps of:

attaching, to the end of the arm, the tracing tip having at least a displacement pulse oscillator, which consists of a projector and a phototransistor, and a roller provided with gaps such as holes or slits, said projector and said phototransistor being disposed at concentric positions with respect to the respective gaps of said roller so as to form an optical axis between the two optical elements;

moving the tracing tip along a desired path, so that a location signal of the tracing tip may be obtained by the displacement pulse oscillator whenever the roller is rotated a predetermined distance as a result of the movement of the tracing tip through respective degrees of freedom, and memorizing said location signal in a memory device;

exchanging the tracing tip for a working tip at the end of the arm;

playing back said location signal, such that the working tip is automatically traced along the predetermined desired path by means of the memorized location signal; and,

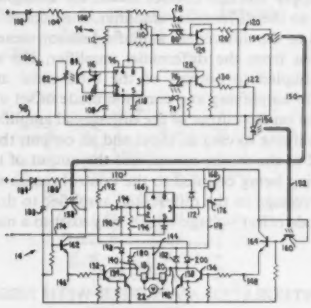
independently controlling the velocity of the working tip with respect to the teaching velocity of the tracing tip.

4,105,938

PROPORTIONAL PULSE CONTROLLER

Victor M. Mathews, Jr., Leawood, Kans., assignor to MKC Electronics Corporation, Kansas City, Kans.

Filed Aug. 20, 1976, Ser. No. 716,099
Int. Cl.[2] G05B *11/01, 11/28*
U.S. Cl. 318—599 **13 Claims**



1. Apparatus for controlling the excitation of an electrical actuator such as a solenoid or motor having a current-carrying winding, said apparatus comprising:

output terminal means adapted to be connected to said actuator for supplying electrical excitation thereto;

circuitry for producing a train of output voltage pulses and delivering said pulses to said terminal means, each of said pulses having an amplitude selected to apply a desired, full operating voltage to said actuator,

said circuitry including control means for varying the duty cycle of said pulse train between a predetermined minimum and maximum, said predetermined minimum having a value sufficient to overcome the starting hysteresis of said actuator; and

a controller having an off condition and an on condition and, in said on condition, providing a range of excitation for said actuator from said minimum to said maximum duty cycle,

said controller including switch means coupled with said circuitry for selectively effecting delivery or interruption of delivery of said pulse train to said terminal means, and a shiftable operating member associated with said switch means and said control means and having an off position corresponding to said off condition of the controller,

said member operating the switch means to effect delivery of said pulse train to said terminal means when the member is shifted in a direction corresponding to the on condition of the controller, and selectively operating said control means to set the duty cycle of said pulse train at a desired level of excitation dependent upon the degree of displacement of the member in said direction away from said off position,

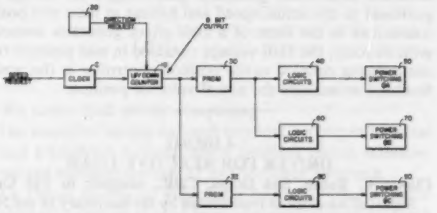
said controller further including means mounting said member for movement away from said off position through an initial, relatively small displacement to operate said switch means, and through a range of control movement thereafter to selectively operate said control means.

4,105,939

DIRECT DIGITAL TECHNIQUE FOR GENERATING AN AC WAVEFORM

Charles H. Culbertson, Towson, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 10, 1976, Ser. No. 713,177
Int. Cl.[2] G05B *11/28*
U.S. Cl. 318—599 **4 Claims**



1. Apparatus for direct digital conversion of DC voltage to an AC output waveform without the use of an AC reference waveform, comprising,

pulse generator means for producing clock pulses,

counter means connected to said pulse generator means and being incremented by said clock pulses and producing a digital output indicative of the count value produced by said clock pulses,

a programmable read only memory means responsive to said digital output of said counter means to develop a pair of logic control signals corresponding to combinations of logic ONES and ZEROS in a pattern sequence indicative of a preprogrammed AC waveform, said programmable read only memory means including a predetermined number of stored words, each incremental change in the count value of said counter means producing a digital output from said counter means which addresses a different stored word, each stored word producing a predetermined pair of logic control signals, and

logic circuit means operatively coupling said programmable read only memory means to a DC voltage power stage consisting of a plurality of power switching devices,

said logic circuit means responding to said logic control signals by controlling the conduction of said power switching devices to produce a pulse width modulated output from said DC voltage power stage corresponding to said preprogrammed AC waveform.

4,105,940

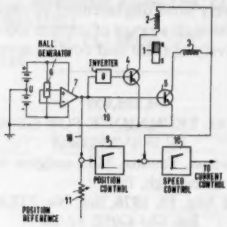
POSITION CONTROL DEVICE

Hans Kühnlein, Nürnberg-Grossgründlach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 17, 1976, Ser. No. 742,703
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1975, 2553119
Int. Cl.[2] G05B *1/06*
U.S. Cl. 318—653 **2 Claims**

1. In a position control device driving a speed controlled motor with a tachometer generator coupled to the motor

providing velocity feedback information for speed control, the drive system including a position controller having as inputs a desired position voltage and an actual position feedback voltage, and a speed controller at the input of which the position controller output is summed with the feedback velocity, the improvement comprising the tachometer generator being a



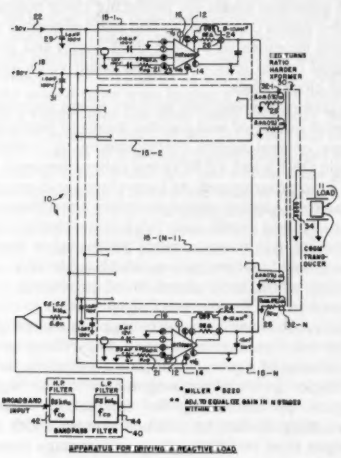
brushless tachometer generator generating a dc voltage proportional to the actual speed and having at least one position transmitter in the form of a Hall effect generator associated with its rotor, the Hall voltage obtained in said position transmitter being coupled to the position controller as the position feedback to indicate the actual value of position.

4,105,941

DRIVER FOR REACTIVE LOAD

Claude C. Routh, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 11, 1977, Ser. No. 823,792
Int. Cl.² H03F *3/68*
U.S. Cl. 330—124 R **7 Claims**



1. Apparatus for driving a reactive load, comprising:

a plurality of N multi-input circuit elements, N ≧ 2, connected in parallel, capable of amplifying a band of frequencies, two inputs of each element being connectable to sources of direct-current voltage, each circuit element and elements connected to its inputs defining a circuit stage;

N means, each means connected to at least one of the inputs of the circuit elements, capable of equalizing the gain of each of the N stages within a prescribed percentage;

a transformer having N primary, intput, windings and one secondary, output, winding, which is connectable to the load, each of the N primary windings having their inputs connected to one of the outputs of the circuit elements;

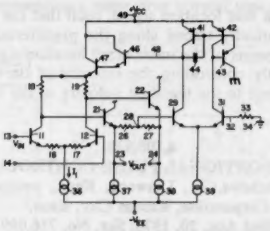
the transformer being so designed that its impedance, whether capacitive or inductive, as seen from the load, balances the inductive or capacitive load, respectively to be connected to it, over the band pass of interest.

4,105,942

DIFFERENTIAL AMPLIFIER CIRCUIT HAVING COMMON MODE COMPENSATION

Paul Michael Henry, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1976, Ser. No. 750,477
Int. Cl.² H03F *3/45*
U.S. Cl. 330—261 **10 Claims**



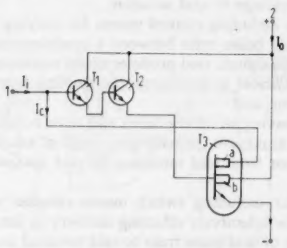
1. An open loop common mode amplifier circuit, comprising: a differential amplifier having inputs, outputs and requiring a supply voltage; control means for changing the supply voltage to the differential amplifier, the control means being coupled to the differential amplifier; sensor means for sensing an output from the differential amplifier, the sensor means being coupled to outputs of the differential amplifier; and means for amplifying any common mode offset voltage which may exist on the output of the differential amplifier, the means for amplifying having an input and an output, the input being coupled to the sensor means, and the output of the means for amplifying being coupled to the control means to change the supply voltage to the differential amplifier to drive any common mode offset voltage which may exist to a minimum level.

4,105,943

INTEGRATED AMPLIFIER WITH NEGATIVE FEEDBACK

Gerhard Krause, Rosenheim, Egarten, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 731,432, Oct. 12, 1976. This application Aug. 10, 1977, Ser. No. 823,402
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641551
Int. Cl.² H03F *3/14*
U.S. Cl. 330—290 **3 Claims**



1. An integrated current amplifier having negative feedback comprising: at least two amplifier stages, a negative feedback arm connected from the amplifier output to the amplifer input,

and the output circuit of an active element of a last amplifier stage is divided so as to produce a division of the output current such that a portion of the current is conveyed into the negative feedback arm and a portion of the current is conveyed into the amplifier output, and d.c. input current means associated with the amplifier stages, the value of an input d.c. current supplied by the current means which determines the amplifier operating point being selected such that the dynamic amplifier input impedance is matched to the characteristic impedance of a line which supplies an input signal, the amplifier input current (I_i) being governed by the equation

$$I_i = kT/eZ$$

where

k is the Boltzmann constant,

T is the absolute temperature

e is the elementary charge and

Z is the characteristic impedance of the line which supplies the signal to be amplified.

4,105,944

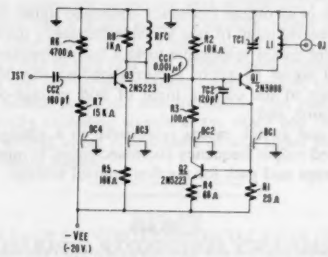
QUIESCENT BIASING OF R-F POWER TRANSISTORS FOR OTHER THAN CLASS A OPERATION

Wendell Goundrey Anderson, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,586

Int. Cl.[2] H03F *3/19*

U.S. Cl. 330—290 **8 Claims**



1. In an r-f amplifier including at least one common-emitter r-f amplifier transistor, each said r-f amplifier transistor in addition to having an emitter electrode having a base electrode connected for receiving at least a portion of an r-f drive signal, the supply of which is susceptible to interruption, and having a collector electrode for connection to a load, the improvement for avoiding undesirable quiescent base-input impedance conditions in each r-f amplifier transistor comprising:

respective current feedback means connected to each r-f amplifier transistor for regulating its emitter current to a prescribed value during interruption of r-f drive signal, each current feedback means including a respective emitter degeneration resistance for its r-f amplifier transistor, a respective auxiliary transistor being of the same conductivity type as its r-f amplifier transistor and having base and emitter and collector electrodes and having emitter-base and collector-base junctions, respective means for applying the quiescent potential drop across its emitter degeneration resistance to a respective circuit including the emitter-base junction of its auxiliary transistor, and means for connecting the collector electrode of its auxiliary transistor to the base electrode of its r-f amplifier transistor; and

means responsive to r-f signal being supplied for disabling said respective current feedback means.

4,105,945

ACTIVE LOAD CIRCUITS

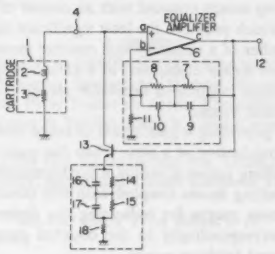
Nobuya Sano, Nara; Hiroshi Goto, Katano, and Yutaka Hirota, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 16, 1977, Ser. No. 778,148

Claims priority, application Japan, Mar. 16, 1976, 51-28718; Mar. 17, 1976, 51-29495

Int. Cl.[2] H03F *1/34*

U.S. Cl. 330—294 **16 Claims**



1. An active load circuit comprising

(a) an amplifier having an input terminal, an output terminal and a feedback terminal and a feedback circuit interconnected between the output and feedback terminals,

(b) a circuit having an impedance frequency characteristic similar to that as viewed from one point in said feedback circuit including the output terminal toward the feedback terminal, and

(c) an active circuit for causing said circuit defined in (b) to convert the voltage at one point in said feedback circuit into current which in turn is applied to the input terminal of said amplifier.

4,105,946

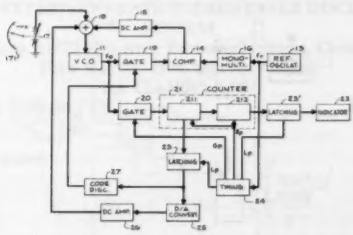
FREQUENCY SYNTHESIZER WITH PHASE LOCKED LOOP AND COUNTER

Yuji Ikeda, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1977, Ser. No. 813,313

Int. Cl.[2] H03B *3/04*

U.S. Cl. 331—1 A **20 Claims**



1. In a frequency synthesizer device having a phase locked loop comprising voltage controlled oscillator means, reference frequency oscillator means and phase comparator means for comparing a phase difference between outputs from the voltage controlled oscillator means and the reference frequency oscillator means to apply the compared output to the voltage controlled oscillator means to stabilize the oscillating frequency thereof, an improvement comprising;

means for generating a series of harmonic waves from the reference signal from said reference frequency oscillator means, said series of harmonic waves being applied to said

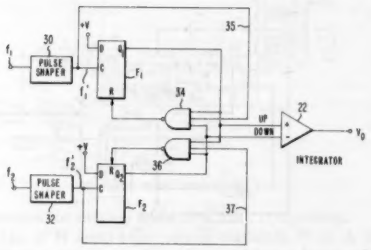
phase comparator means for phase comparing with the output from said voltage controlled oscillator means,
means for coarsely changing the output frequency of said voltage controlled oscillator means to a desired frequency,
first gate means coupled with the output of said voltage controlled oscillator means,
counter means for counting the number of output waves from said voltage controlled oscillator means through said first gate means,
first latching means coupled with an output of said counter means which provides the least significant digit of a decimal number of a count by said counter means,
second gate means connected in a closed loop comprising said voltage controlled oscillator means and said phase comparator means,
means for providing a gate signal to make said second gate means conductive at a time when the number from said first latching means is within a predetermined range,
second latching means coupled with said counter means,
first indicator means for indicating the desired frequency value correspondingly to the counted number through said second latching means,
and means coupled with the output from said reference frequency oscillator means for providing a gate pulse to make said first gate means conductive, latching signals to operate said first and second latching means and a reset signal to reset said counter means, said gate pulse having a pulse width predetermined correspondingly to the reference frequency and being repeatedly generated with a constant period, said latching signals being provided just after each one of said gate pulses ends, and said reset signal being generated after said latching signals but before next gate pulse.

4,105,947

PULSE WAVE PHASE AND FREQUENCY DETECTOR

Albert Timothy Crowley, Somerdale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 16, 1977, Ser. No. 833,750
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 A **6 Claims**



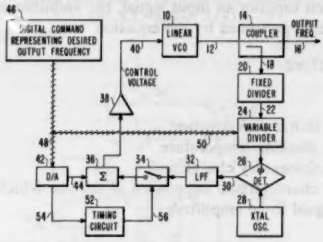
1. A phase and frequency detector, comprising
first and second flip-flops each having a leading edge trigger input, an output and a reset input,
means to apply a first pulse wave to the trigger input of said first flip-flop,
means to apply a second pulse wave to the trigger input of said second flip-flop, and
gate means responsive to outputs of said flip-flops and to said first and second pulse waves to apply reset signals to reset inputs of both flip-flops solely during the times that the first and second pulses overlap in time.

4,105,948

FREQUENCY SYNTHESIZER WITH RAPIDLY CHANGEABLE FREQUENCY

Herbert J. Wolkstein, Livingston, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,328
Int. Cl.² H03B *3/04*
U.S. Cl. 331—14 **5 Claims**



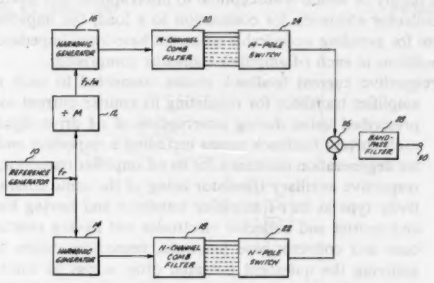
1. A frequency synthesizer capable of rapidly changing its output frequency from one value to another value, comprising
a phase locked loop including a voltage-controlled oscillator, a phase detector, a variable-frequency divider coupling an output of the voltage-controlled oscillator to an input of the phase detector, a source of a reference oscillation coupled to the other input of the phase detector, and a path for a first control voltage from the output of the phase detector to the control input of the voltage-controlled oscillator,
a source of an output frequency command signal coupled to the control input of said variable-frequency divider,
converter means responsive to said output frequency command signal to apply a corresponding second control voltage to the control input of said voltage-controlled oscillator, and
timing and switch means responsive to a change in said desired output frequency command signal to momentarily interrupt said path for the first control voltage.

4,105,949

FREQUENCY SYNTHESIZER APPARATUS

Robert H. Hardin, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 15, 1977, Ser. No. 787,869
Int. Cl.² H03B *21/00, 21/02*
U.S. Cl. 331—37 **17 Claims**



9. Frequency synthesizer apparatus responsive to an applied signal having a frequency f, for supplying a substantially single frequency output signal at a frequency selectable from a plurality of output frequencies, said plurality of output frequencies including a number of frequencies numerically equal to the mathematical product of M times N, where M and N are

preselected integers, said output frequencies being spaced-apart from one another in the frequency domain by a frequency interval equal to f_r/M, said frequency synthesizer apparatus comprising:

frequency divider means responsive to said applied signal for supplying a first signal having a frequency f_r/M

first harmonic generator means responsive to said first signal for supplying a second signal having a plurality of at least M signal components, said M signal components being at the frequencies jf_r/M, $(j+1)\ f_r/M \ldots (j+M-1)\ f_r/M$ where j is a preselected non-zero integer that is greater than the quantity $M(N-1)/2$;

first harmonic selector means responsive to said second signal for supplying a first selected signal at a frequency corresponding to the frequency of a selected one of said M signal components of said second signal;

second harmonic generator means responsive to said applied signal for supplying a third signal having a plurality of at least N signal components, said N signal components being at the frequencies kf_r, $(k+1)\ f_r \ldots (k+N-1)\ f_r$ where k is a preselected non-zero integer;

second harmonic selector means responsive to said third signal for supplying a second selected signal at a frequency corresponding to the frequency of a selected one of said N signal components of said third signal;

a single mixer means responsive to said first selected signal and responsive to said second selected signal, said mixer means supplying a signal having a first signal component at a frequency equal to the sum of the frequencies of said first and second selected signals and having a second signal component at a frequency equal to the difference between the frequencies of said first and second selected signals; and

a single filter means responsive to said signal supplied by said mixer means for supplying said substantially single frequency output signal at said selectable output frequency, said filter means having a passband including a predetermined one of said first and second signal components for each first and second selected signal supplied by said first and second harmonic selector means, said passband substantially excluding signals at the other one of said first and second signal components of said signal supplied by said mixer means.

4,105,950

VOLTAGE CONTROLLED OSCILLATOR (VCO) EMPLOYING NESTED OSCILLATING LOOPS

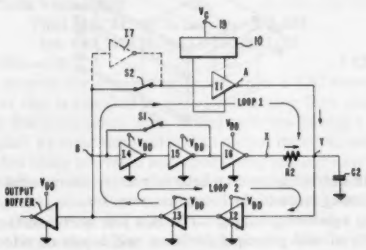
Andrew Gordon Francis Dingwall, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,285

Claims priority, application United Kingdom, Sep. 13, 1976, 37853/76

Int. Cl.² H03B *3/04, 5/24;* H03K *3/282*

U.S. Cl. 331—57 **6 Claims**



5. A voltage controlled oscillator comprising:

M inverters connected in cascade, and N inverters connected in cascade; where M and N are integers;

means connecting the output of the Mth of said M inverters to the input of the first one of said M inverters for forming a loop normally oscillating at a predetermined frequency;

means connecting the input of the first of said N inverters to the output of one of said M inverters, and means connecting the output of the Nth of said N inverters to the output of a different one of said M inverters for forming a second loop; and

means responsive to an input control voltage connected to at least one of said N inverters for altering its conductivity in response to said control voltage and thereby altering said predetermined frequency of oscillation.

4,105,951

MULTIPACTOR DISCHARGE ARRANGEMENTS

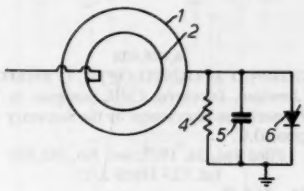
Alan Hugh Pickering, Springfield; Michael Barry Clive Brady, Maldon, and Peter Frederick Lewis, Chelmsford, all of England, assignors to English Electric Valve Company Limited, England

Filed Oct. 22, 1976, Ser. No. 734,883

Claims priority, application United Kingdom, Oct. 24, 1975, 43704/75

Int. Cl.² H01P *1/14;* H03B *9/10*

U.S. Cl. 331—90 **13 Claims**



1. A multipactor discharge arrangement comprising a source of radio frequency energy, two multipactor discharge electrodes arranged such that one surrounds the other to form a co-axial waveguide which is coupled to said source of radio frequency energy whereby, in operation, in a multipactor discharge condition a net current flows from one of said multipactor discharge electrodes to the other, and means connected to utilize such net current to create a self-bias voltage on one of the electrodes.

4,105,952

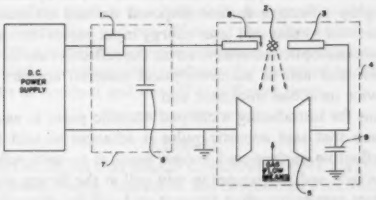
HIGH REPETITION RATE PULSED LASER DISCHARGE SYSTEM

John Tulip, 11823 87th Ave., Edmonton, Alberta, Canada

Filed May 21, 1976, Ser. No. 688,927

Int. Cl.² H01S *3/097*

U.S. Cl. 331—94.5 PE **6 Claims**



1. An apparatus for producing a pulsed electric glow discharge comprising:

a high voltage energy storage capacitor circuit,

a first pair of spaced electrodes for providing a glow discharge therebetween in response to being connected in

circuit with said high voltage energy storage capacitor circuit,

an ionizable gaseous medium disposed between said first pair of spaced electrodes within which said glow discharge may be established,

means for switching said high voltage energy storage capacitor circuit in circuit with said first pair of spaced electrodes to initiate said glow discharge, said means for switching including a second pair of spaced electrodes forming a switching spark gap located adjacent said first pair of electrodes and electrically connected in series with said first pair of electrodes,

means for providing a transverse flow of gas between said first pair of electrodes, and

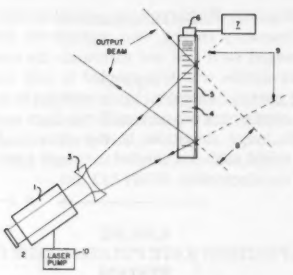
means for initiating a spark discharge across said second pair of electrodes, said spark discharge providing ionization of said gaseous medium between said first pair of electrodes for suppression of arcs therebetween and further serving to switch said high voltage energy storage capacitor circuit in circuit with said first pair of electrodes.

4,105,953

CHIRPED ACOUSTO-OPTIC Q SWITCH

James L. Jernigan, Inyokern, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1977, Ser. No. 761,831
Int. Cl.[2] H01S 3/11
U.S. Cl. 331—94.5 Q **5 Claims**



1. An acousto-optic Q-switch for switching a laser beam from a laser beam source to an output from a high Q condition wherein laser energy is input along an optical path to the Q-switch and reflected back along the same optical path to its source, comprising:

a cell of acousto-optic material placed in said optical path;

a highly reflective surface disposed on said acousto-optic material so that said laser energy input passes through the acoustic-optic material to strike the reflective surface such that said cell of acousto-optical material appears to be twice its actual thickness; and

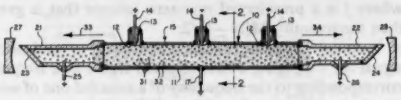
means for introducing a chirped acoustic pulse to said cell, such that said acoustic pulse is adjacent to said highly reflective surface and travels parallel to said reflective surface and propagates in said cell at the Bragg angle to laser energy traveling through said cell for all portions of the chirped acoustic pulse during the high Q condition, whereby the chirped acoustic pulse diffracts the laser energy input causing the highly reflective surface to reflect the laser energy input back to its source when the chirped pulse is totally within the cell.

4,105,954

DOUBLE-CONFINED MULTIPLE ANODE HOLLOW CATHODE LASER

Shing Chung Wang, Temple City, and Randolph W. Hamerdinger, Glendale, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1976, Ser. No. 701,472
Int. Cl.[2] H01S 3/00
U.S. Cl. 331—94.5 PE **6 Claims**



1. Apparatus for promoting the emission of radiation by utilizing electrical energy to raise metal vapor material from an initial state to an excited state comprising:

enclosed means, including an elongated body section defining a first electrode and a pair of end sections terminating in means for transmitting radiation, for enveloping a space occupied by said material;

a plurality of second electrodes each being substantially equally spaced, in electrically insulated relationship with said first electrode, longitudinally along the exterior of said body section; each of said second electrodes communicating with the space enveloped by said enclosed means, and being adapted to receive electrical energy for substantially uniform distribution through said space to said first electrode to substantially uniformly raise said material as distributed in said space from said initial state to said excited state; and

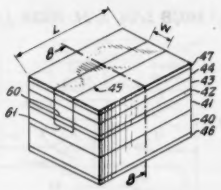
cataphoretic means disposed along each of said end sections for establishing an electrical field within said space to accelerate said material away from the nearest one of said radiation transmission means and toward said first electrode.

4,105,955

HETEROSTRUCTURE LASER HAVING A STRIPE REGION DEFINED IN AN ACTIVE LAYER BY A DIFFERENCE IN IMPURITY

Izuo Hayashi, and Roy Lang, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1977, Ser. No. 775,839
Claims priority, application Japan, Mar. 11, 1976, 51-26440
Int. Cl.[2] H01S 3/19
U.S. Cl. 331—94.5 H **18 Claims**



1. In a stripe geometry heterostructure semiconductor laser comprising a multiple heterojunction semiconductor crystal having a pair of principal surfaces, a pair of end surfaces transversely of said principal surfaces, and a pair of side surfaces transversely of said principal and said end surfaces, a pair of reflection surfaces on the respective end surfaces, and a pair of electrodes on the respective principal surfaces, said crystal including only one active layer bounded by a pair of heterojunction interfaces and said end and said side surfaces, said active layer comprising a stripe region extending between said

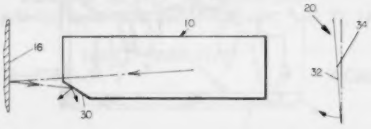
end surfaces and a contiguous region between said stripe region and at least one of said side surfaces, said interfaces being substantially parallel to each other at least at their portions defining said stripe region, said stripe region being in substantial coincidence with an oscillation producing region where laser oscillation takes place, said oscillation producing region being restricted by said interfaces in a first direction perpendicular to said interfaces, said stripe region and said contiguous region having different impurity characteristics such that said stripe region has a higher dielecric constant than said contiguous region, whereby said oscillation producing region is restricted to said stripe region in a second direction parallel to said interfaces and said laser oscillation is stabilized to a single fundamental transverse mode.

4,105,956

Q-SWITCHED LASER AND LASER ROD

Norman L. Boling, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 6, 1976, Ser. No. 730,038
Int. Cl.[2] H01S *3/111*
U.S. Cl. 331—94.5 Q **19 Claims**



1. In a Q-switched laser which includes a front, partially transmissive mirror, a rotating rear mirror switching means, spaced-apart from said front mirror, for causing a rear mirror to be optically aligned for precise retro-reflection with the front mirror only when a laser pulse is desired, and a flash tube for providing pumping power for said laser, an improved laser rod member, positioned between said front mirror and said rear mirror switching means, which comprises:

an elongated, solid, rod like member made from a material containing a lasable element, said rod like member including front and rear polished faces, said rod like member further including pulse suppression means for preventing the passage of shallow angle reflected or refracted beams through said rod like member, said pulse suppression means being integrally formed on the edge of one of said polished faces and extending towards the center of said polished face an extent great enough to allow interception of said shallow angle beams.

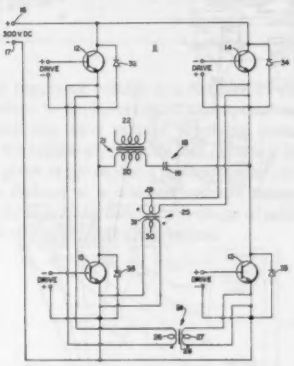
4,105,957

FULL WAVE BRIDGE POWER INVERTER

Frank Cathell, San Diego, Calif., assignor to Qualidyne Systems, Inc., Chula Vista, Calif.

Filed Sep. 21, 1977, Ser. No. 835,403
Int. Cl.[2] H02M *7/537;* **H03K** *3/30*
U.S. Cl. 331—110 **7 Claims**

1. An inverter for converting power from a DC source to AC power that is supplied to a load comprising first, second, third and fourth switches, each of said switches having a control terminal, an input terminal and an output terminal, each of the switches being activated into conducting and non-conducting states between the input and output terminals in response to the voltage magnitude between the control and input terminals having values in first and second ranges, respectively; means for connecting said switches in a bridge circuit with the source and load, said bridge circuit including an apex to which the load is adapted to be connected; the input and output terminals of said first and second switches being in a first series circuit with each other, terminals for the source, and the apex, so that current flows in a first direction through the apex and between the input and output terminals of the first and second switches in response to the first and second switches both being closed; the input and output terminals of said third and fourth switches being connected in a second series circuit with each other, the source terminals, and the apex, so that current flows in a second direction through the apex and between the input and output terminals of the third and fourth switches in response to the third and fourth switches being closed; first means for simultaneously activating the first and second switches into conducting and cut-off states during a first time interval, second means for simultaneously activating the third and fourth switches into conducting and cut-off states during a second time interval; said first activating means including: (a) first means for respectively biasing the control terminals of the first and second switches relative to the input terminals of the first and second switches, said first and second switches being likely to have dissimilar characteristics in response to the voltages biasing the control terminals thereof so that one of the first and second switches has a tendency to conduct and cut off prior to the other one in response to the biasing voltages therefor, and (b) second means for coupling currents between the input terminals of the first and second switches, said second means



being arranged so that in response to either of the first or second switches being rendered into the current conducting and cut-off states, the other switch is supplied with a voltage tending to activate it into a like state and substantially overcome the tendency for the first and second switches to conduct and cut off at different times; said second activating means including: (a) third means for respectively biasing the control terminals of the third and fourth switches relative to the input terminals of the third and fourth switches, and said third and fourth switches being likely to have dissimilar characteristics in response to the voltages biasing the control terminals thereof so that one of the third and fourth switches has a tendency to conduct and cut off prior to the other one in response to the biasing voltages therefor, and (b) fourth means for coupling currents between the input terminals of the third and fourth switches, said fourth means being arranged so that in response to either of the third or fourth switches being rendered into the current conducting and cut-off states, the other switch is supplied with a voltage tending to activate it into a like state and substantially overcome the tendency for the third and fourth switches to conduct and cut off at different times.

4,105,958

LARGE DELAY SPREAD CHANNEL SIMULATOR

John Norman Pierce, Lexington, and Steen Allan Parl, Belmont, both of Mass., assignors to Signatron, Inc., Lexington, Mass.

Filed Feb. 2, 1976, Ser. No. 654,511
Int. Cl.[2] H03H *7/14, 7/22, 7/28, 7/30*
U.S. Cl. 333—29 **19 Claims**

1. Apparatus for simulating the characteristics of a signal channel and responsive to a channel input signal to produce a simulated channel output signal, said apparatus comprising

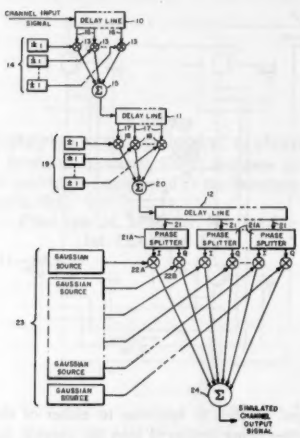
at least two cascade-connected delay line means, each responsive to a delay line input signal and having a selected number of tap outputs for providing a plurality of tap output signals therefrom;

first means associated with all but a selected one of said delay line means for generating a plurality of randomly characterized signals;

first further means associated with each of said all but one of said delay line means and responsive to the plurality of said tap output signals associated therewith and to said plurality of randomly characterized signals associated therewith for producing a plurality of intermediate signals from each of said all but one of said delay line means;

first summing means associated with each of said all but one of said delay line means and responsive to said plurality of intermediate signals associated therewith for providing a delay line output signal representing the sum thereof;

second means associated with said selected one of said delay line means for generating a plurality of Gaussian characterized signals;



second further means associated with said selected one of said delay line means and responsive to the plurality of tap output signals associated therewith and to said Gaussian characterized signals for producing a plurality of intermediate signals from said selected one of said delay line means;

second summing means associated with said selected one of said delay line means and responsive to said plurality of intermediate signals for providing a delay line output signal representing the sum thereof;

the delay line input signal to the first of said cascade-connected delay line means being the channel input signal, the delay line signal from the last of said cascade-connected delay line means being the simulated channel output signal, and the delay line input signals of all of said delay line means other than said first delay line means being the delay line output signal from the immediately preceding delay line means of said cascaded delay line means.

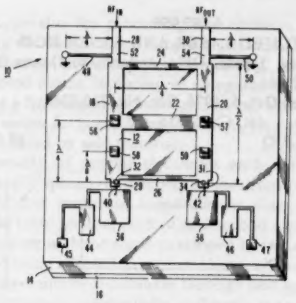
4,105,959

AMPLITUDE BALANCED DIODE PHASE SHIFTER

Vitaly Stachejko, Willingboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,290
Int. Cl.[2] H01P *3/08, 1/18, 1/22*
U.S. Cl. 333—31 R **6 Claims**

1. A phase shifter for selectively introducing a predetermined phase shift in a microwave frequency signal, said phase shifter being of the reflection type including a pair of transmission lines of substantially equal length, the length of each transmission line being a function of the signal wavelength and at least one quarter wavelength long, said pair of lines being interconnected by at least two branch transmission lines approximately one quarter wavelength apart and of the order of one quarter wavelength in length, an RF input terminal and an RF output terminal connected to one extremity of said pair of transmission lines, respectively, switching means connected to the other extremity of said pair of transmission lines for switching each of said transmission lines from an open termination to a shorted termination, means for biasing said switching means by a first voltage in a first direction and then by a second voltage in a reverse direction whereby the reflection coefficient phase angle shifts substantially a given amount providing a



given amount of phase shift of said microwave frequency signal and whereby a first and second insertion loss is produced at said first and second bias voltages respectively, wherein the improvement comprises:

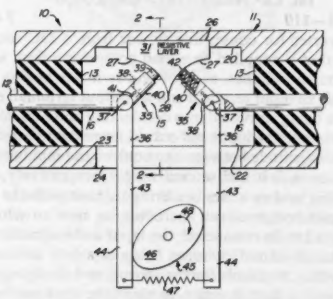
resistive means disposed on each of said pair of transmission lines at a spacing approximately one quarter wavelength from said switching means such that at said first bias voltage said resistive means is decoupled from said RF power and at said second bias voltage said resistive means is coupled to said RF power at a predetermined value to attenuate said power, whereby the difference in the insertion loss over a predetermined frequency range at said first and second bias voltages is negligible.

4,105,960

BROAD-BAND CONTINUOUSLY VARIABLE ATTENUATOR

Helmut Bacher, 771 Quince Orchard #11, Gaithersburg, Md. 20760

Filed Dec. 20, 1976, Ser. No. 752,209
Int. Cl.[2] H01P *1/22*
U.S. Cl. 333—81 A **13 Claims**



1. A variable microwave attenuator comprising an outer

conductive member, an inner conductive member extending longitudinally of said outer conductive member and combining therewith to define a microwave transmission line, said inner conductive member being interrupted to provide a pair of spaced inner conductor member ends, a single resistive member electrically connected to said outer conductive member and extending transversely therefrom toward the space between said inner conductor member ends, and an electrical connector means extending from each of said inner conductive member ends to a respective region of said resistive member to provide attenuation series and shunt current paths through said resistive and outer conductive members, at least one of said electrical connector means being continuously movable relative to and in contacting engagement with said resistive member to selectively vary the resistances of said series and shunt paths for selecting the desired attenuation.

4,105,961
PHONOGRAPH PICK-UP ARM CONTROL ARRANGEMENT

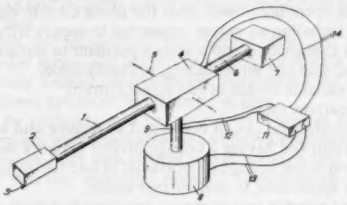
Dexter Robert Plummer, Ongar, and Roderick Frank Jones, London, both of England, assignors to Strathearn Audio Limited, Belfast, Northern Ireland

Filed Nov. 25, 1975, Ser. No. 635,268

Claims priority, application United Kingdom, Nov. 27, 1974, 51446/74

Int. Cl.² G05B *11/01*

U.S. Cl. 318—676 **4 Claims**



1. A circuit arrangement for use in controlling the movement of a pivoted tone arm for a phonograph arm in first and second planes including first and second motors controlling the movement of the arm in the respective planes, a drive element in each motor, means including terminals to connect the drive elements to a source of power, first adjustable means comprising a first potentiometer connected between a terminal of the connection means and the drive elements to determine the total amount of power fed respectively to each of the drive elements from the source of power, and second adjustable means comprising a second potentiometer connected to said first potentiometer and to said drive elements for varying the ratio of the power fed to the two respective elements, the pivot axes of the arm in the first and second planes passing through one of the motors.

4,105,962
BATTERY CHARGER

Donald K. Scott, Jr., Waynesboro, and Michael D. McIntosh, South Mountain, both of Pa., assignors to Landis Tool Company, Waynesboro, Pa.

Continuation of Ser. No. 560,947, Mar. 21, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,681

Int. Cl.² H02J *7/04*

U.S. Cl. 320—32 **4 Claims**

1. A constant voltage battery charger comprising

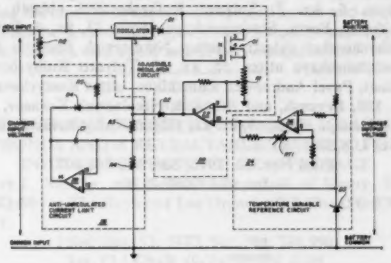
a three terminal voltage regulator having input, output and reference terminals adapted to be supplied with D.C. voltage having a predetermined, constant level,

means for continuously varying the reference voltage with the amount of charge required to establish a constant charging voltage whereby the rate of charge of a battery will be continuously variable with the state of charge of the battery,

said continuously varying means including,

an operational amplifier,

means for supplying a predetermined voltage to the noninverting input of said operational amplifier comprising a second operational amplifier and means for selectively varying the gain of said second operational amplifier as a function of temperature,



means for supplying voltage as a function of regulator output voltage to the inverting of said operational amplifier, said inverting input voltage supplying means including means for selectively varying said inverting input voltage over a given range so that a predetermined output voltage can be defined at a selected ambient temperature, and means for supplying the output voltage of said operational amplifier to said reference terminal.

4,105,963
BRUSHLESS WELDING GENERATOR

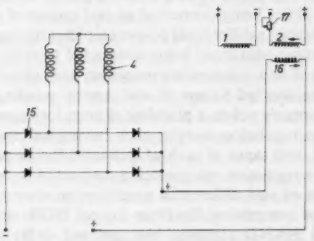
Aurel Dobranis, Leverkusen, Germany, assignor to J. U. W. Muller, Maschinen-und Armaturenfabric GmbH, Leverkusen, Germany

Filed Jun. 2, 1977, Ser. No. 803,117

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624904; May 17, 1977, 2722199

Int. Cl.² H02P *9/30*

U.S. Cl. 322—48 **12 Claims**

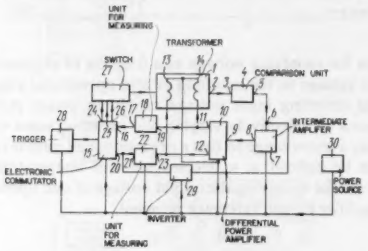


1. Brushless welding generator with a homopolar machine supplying welding current, comprising: winding-free rotors with several pole rings each forming an air gap of varying size around its periphery with the stator, said homopolar machine being divided into two electromagnetic parts each having an exciting winding for forming an exciting field controlled in one of said two electromagnetic parts in opposition to the welding current.

4,105,964
VOLTAGE REGULATION AND STABILIZATION DEVICE

Vladimir Konstantinovich Lebedev, ulitsa Engelsa, 25, kv. 12; Jury Dmitrievich Gupalo, ulitsa Anri Barbjusa, 22-26, kv. 25; Vladimir Alexandrovich Troitsky, ulitsa Bratislavskaya, 8, kv. 86; Nikolai Grigorievich Bely, ulitsa Stepana Razina, 3, kv. 10; Vladimir Alexandrovich Nagaitsev, ulitsa Stroitelei, 26, kv. 6; Boris Vladimirovich Nudelman, ulitsa Filatova, 1/22, kv. 87, all of Kiev; Alexandr Ivanovich Krasnov, Molodezhny bulvar, 4, kv. 7, Tolyatti Kuibyshevskoi oblasti; Jury Iosifovich Borju, Stavropolskaya ulitsa, 23, kv. 6, Tolyatti Kuibyshevskoi oblasti; Dmitry Nikolaevich Parshin, Kommunistisheskaya ulitsa, 55, kv. 80, Tolyatti Kuibyshevskoi oblasti; Pavel Andreevich Zhinzhikov, ulitsa Kostycheva, 41, kv. 195, Bryansk, and Alexandr Nikolaevich Korneev, Promyshlennaya ulitsa, 69, kv. 23, TolyattiKuibyshevskoi oblasti, all of U.S.S.R.

Filed Nov. 30, 1976, Ser. No. 746,007
Int. Cl.[2] G05F *1/20*
U.S. Cl. 323—43.5 S **33 Claims**



1. A voltage regulation and stabilization device comprising:

(a) a transformer with power windings on its magnetic circuit legs, said power windings having taps, yokes of said transformer being arranged between said magnetic circuit legs, some of said yokes having control windings for direct current magnetization of said yokes, a portion of said power windings' turns being arranged in a window formed by the yokes, whereupon there are mounted said control windings;

(b) a switch connected to the power windings' taps of said transformer; and

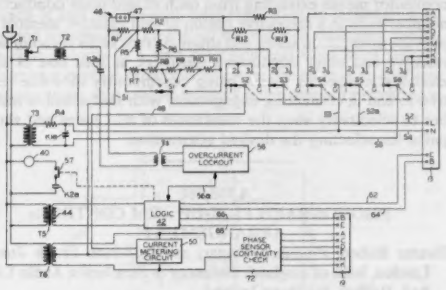
(c) at least one control circuit comprising: a comparison unit having an input and an output, said input being connected to said transformer; an intermediate amplifier having an input and a reversible output, said input of said intermediate amplifier being connected to said output of said comparison unit; a differential power amplifier having an input and output, said input being connected to said reversible output of said intermediate amplifier, each of said outputs being connected to one of said control windings of said transformer's yokes; a plurality of units for measuring the voltage regulation margin, each having an input and an output, said input of each of said units for measuring the voltage regulation margin being connected to one of said outputs of said differential amplifier; an electronic commutator comprising flip-flops logical NOR circuits and logical NAND circuits, inverters and delay units and having inputs and outputs, said inputs being connected to respective outputs of said units for measuring the voltage regulation margin, said outputs of said electronic commutator being connected to said switch connected to the power windings' taps of said transformer; and

a power source for the control circuit's units to which there is connected said comparison unit, said intermediate amplifier, said differential power amplifier, said electronic commutator and said units for measuring the voltage regulation margin.

4,105,965
STATIC TRIP CIRCUIT BREAKER TEST SET

Ronald R. Russell, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jul. 14, 1977, Ser. No. 815,628
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—28 CB **17 Claims**



1. A field test set for circuit breakers having phase current monitoring current transformers normally individually connected to supply phase current signals to separate phase signal inputs of a static trip unit for processing to determine the existence of an overcurrent condition, the trip unit including a power supply connected to the phase signal inputs for deriving trip unit operating power from the phase current signals and further including an output connected to supply tripping current for energizing a trip solenoid pursuant to initiating a trip function, said test set including, in combination:

A. a variable source of test signal current;

B. a current meter;

C. a calibration circuit connected to receive said test signal current and having a voltage divider network developing a test signal voltage proportional to said test signal current for application to said current meter;

D. test selector switch means operating to selectively route said test signal current from said calibrating circuit to one of the trip unit phase signal inputs;

E. a power source supplying test power current to directly power up the trip unit power supply independently of the phase signal inputs; and

F. test logic circuitry operating to signal a successful execution of a test trip function in response to the receipt of an effective magnitude of tripping current generated at the trip unit output, said test logic circuitry further operating to coordinate the application of said test signal current and said test power current to the trip unit.

4,105,966
REMOTE LIGHTNING MONITOR SYSTEM

Carl L. Lennon, and Thomas O. Britt, both of Merritt Island, Fla., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 29, 1977, Ser. No. 782,482
Int. Cl.[2] G01R *13/04, 19/16*
U.S. Cl. 324—113 **6 Claims**

1. An apparatus for monitoring lightning strikes comprising:

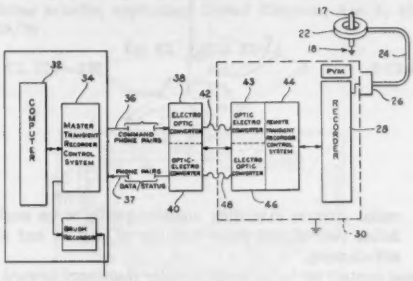
(a) an electrically conductive elongated member located in the vicinity where said lightning strikes are to be monitored so that electrical currents are generated in said elongated member proportional to the intensity of said lightning strikes;

(b) means for sensing the change in current flowing through said elongated member and generating a voltage responsive thereto;

(c) an on-site transient recorder control system;

(d) an on-site recorder means for converting said generated voltages to digital signals and storing said digital signals;

(e) an radio frequency interference proof environmental housing enclosing said recorder means and said recorder control system;
(f) a remotely located control means for generating electrical command signals for controlling storing and transmitting of said digitial signals in and from said recorder means;
(g) cables extending between said remotely located control means and said housing;
(h) an optical/electrical interface means interposed between said cables and said transient recorder control system for providing communication from outside said housing to said recorder control system located in said housing;



(i) means for transmitting said command signals to said recorder control system and said transient recorder means causing said recorder means to record said digital information, and
(j) means for transmitting information from said on site recorder means and said recorder control system to said remotely located control means representing the change in current produced by lightning strikes;

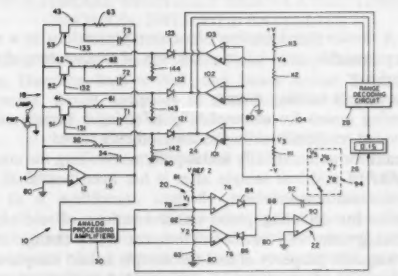
whereby by enclosing said recorder control system and said recorder means within said housing and providing communication therewith from said control means through said optical electrical interface electrical isolation therebetween is provided.

4,105,967

AUTOMATIC RANGE SELECTION CIRCUIT

James H. Macemon, Glen Burnie, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 1, 1976, Ser. No. 728,689
Int. Cl.[2] G01R *15/08;* **H03F** *1/36;* **G01J** *3/30*
U.S. Cl. 324—115 **10 Claims**



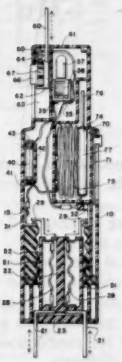
1. An automatic range selection circuit, which comprises:
an amplifier;
adjustable impedance means coupled between an input and an output of said amplifier for controlling the gain of said amplifier;
analog means for comparing the signal at said output from said amplifier with an upper voltage level and a lower voltage level, said analog comparing means including an under-range comparator, an over-range comparator and an integrator, each of said comparators being coupled to the output of said amplifier and having and output coupled to said integrator;
said analog comparing means being operable to generate a positive or negative control signal at an output of said integrator when the signal at said amplifier output is higher than said upper voltage level or lower than said lower voltage level; and
analog control means coupled to said adjustable impedance means and responsive to said control signal from said comparing means for automatically increasing or decreasing the amount of impedance coupled across said amplifier until the level of the signal at said output of said amplifier is between said upper and lower voltage levels.

4,105,968

ELECTRICAL TESTER HAVING RETRACTABLE PRONGS AND A RETRACTABLE TEST ROD FOR INDICATING PRESENCE OF A VOLTAGE

Robert L. Mobley, and Della Mobley, both of Henry, Tenn., assignors to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 13, 1977, Ser. No. 786,990
Int. Cl.[2] G01R *19/16, 31/02, 1/06*
U.S. Cl. 324—133 **1 Claim**



1. An electrical test unit for alternatively indicating voltage in the female contacts of a wall outlet or at two remote electrical contacts, comprising
a housing in which a pair of electrical male prongs are mounted to a slidable block positioned to extend the two prongs beyond the housing in a first fully extended position or to retract the two prongs within the housing in a second retracted position,
an electrical light bulb electrically connected to a pair of contact clips, each of which is mounted in the housing so as to connect to an individual contact means, each contact means being detachably engaged by a separate terminal mounted on said slidable block and electrically connected to a respective one of said prongs in the first fully extended position of the prongs so as to electrically connect a said prong to a said contact clip, together with
an interior chamber located in the housing in which a flexible test lead is stored, said chamber blocked by a door in a wall of the housing, said housing also fitted with a slidable metal test rod slidably mounted to extend beyond the housing in a first fully extended position and to slidably retract within the housing in a second retracted position,
said test rod detachably engaged to contact means, in the first fully extended position, which contact means are electrically connected to one of the contact clips of the light bulb, said contact means fixed to the interior of the housing, and said test lead connected internally to a second of the contact clips of the light bulb, in which

the metal prongs are electrically disengaged from their contact means when moved from the first fully extended position towards the second retracted position, and in which the test rod is electrically disengaged from its contact means when moved from the first fully extended position towards the second retracted position, such that neither of the metal prongs nor the test rod are electrically connected to the internal circuitry of the tester except when in a fully extended position.

4,105,969

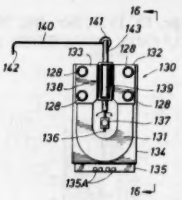
GALVANOMETER MECHANISM MOUNTED ON PRINTED CIRCUIT BOARD HAVING PLUG PORTION FOR INSERTION INTO CONTROL CONSOLE RECEPTACLE

Leon Harlan Ivy, Box 1325, Alvin, Tex. 77511

Division of Ser. No. 599,177, Jul. 25, 1975, abandoned. This application Feb. 16, 1977, Ser. No. 769,221

Int. Cl.[2] G01R *1/04, 5/02;* **G01D** *15/24*

U.S. Cl. 324—151 R **3 Claims**



1. A galvanometer mechanism for providing a printed display of electrical signals, said galvanometer mechanism comprising:

a circuit board having an electrical circuit printed thereon and defining a plug portion;

a plurality of electrical contacts being defined on said plug portion of said circuit board and being electrically connected to said printed electrical circuit, said plug portion being adapted for insertion into a galvanometer control console receptacle for connection to appropriate galvanometer actuating circuitry;

a magnet being fixed to said circuit board and having a pair of spaced legs defining the poles of the magnet;

a torsion bar being secured between the legs of said magnet;

electrical coil means connected to said printed electrical circuit, said coil means being supported by said torsion bar and being rotated against the restraining force of said torsion bar responsive to the electrical signal being applied to said coil; and

printing apparatus being operatively connected to said coil means for movement in response to said electrical signal and being positioned relative to print receiving apparatus by said coil means.

4,105,970

TEST PIN

Jonathon H. Katz, Brookline, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Dec. 27, 1976, Ser. No. 757,778

Int. Cl.[2] G01R *1/06, 31/02;* **H01H** *1/06*

U.S. Cl. 324—158 P **10 Claims**

1. A test pin comprising:

a body,

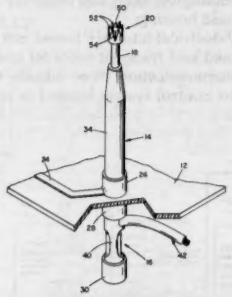
a slide, and

a spring,

said spring being carried in said body and engaging said slide to yieldingly bias said slide away from said spring, and

said slide terminating away from said spring in a crown formed from an integral body of conductive material,

said crown including a multiplicity of spaced sharp contacts, said multiplicity of spaced sharp contacts including a central sharp contact and a multiplicity of sharp contacts spaced therearound in a contact set, each contact of said set being separated from adjacent contacts of said set by continuous



radial grooves extending uninterruptedly at an angle to define two of said sharp contacts of said set and allow self-cleaning,

said contact set being longitudinally positioned toward said spring from said central contact.

4,105,971

PERMEABILITY RESPONSIVE OSCILLATOR FOR DETECTING PHASE TRANSFORMATIONS AT VARIOUS COOLING RATES

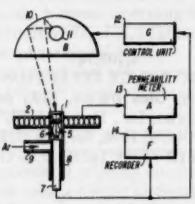
Harri Nevalainen, Terästehdas B 99, 55100 Imatra 1, Finland (55100)

Filed Sep. 13, 1976, Ser. No. 722,475

Claims priority, application Finland, Sep. 11, 1975, 752545

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—203 **11 Claims**



1. A device for detecting phase transformations in a magnetic permeable material as a function of temperature change comprising:

test sample holding means;

heating means for automatically effecting a variety of elevated temperatures in the sample being tested;

means for automatically and rapidly controlling the cooling rate of said test sample after it has been heated to said elevated temperature;

means for detecting phase transformations of said sample being tested as a function of temperature by changes in the magnetic property of said test sample as said sample cools from its elevated temperature, said detecting means including a coil operatively coupled to said test sample, a harmonic oscillator operatively coupled to said coil, said coil constituting the frequency determining inductance of said oscillator;

means for automatically sensing the temperature of said sample as it cools;

whereby phase changes in the test sample cause changes of the magnetic properties of said magnetic permeable material which in turn cause changes in the oscillator fre-

quency of said harmonic oscillator, said frequency being detected along with the temperature to yield information for use in preparing continuous cooling phase transformation diagrams.

4,105,972

PIPELINE INSPECTION VEHICLE FOR DETECTING DEFECTS IN PIPELINE WALLS

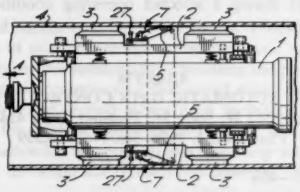
Ian Smith, Ashington, England, assignor to British Gas Corporation, England

Filed Apr. 5, 1977, Ser. No. 784,911

Claims priority, application United Kingdom, Apr. 9, 1976, 14555/76

Int. Cl.² G01R 33/12

U.S. Cl. 324—220 **9 Claims**



1. A pipeline inspection vehicle for detecting defects in pipeline walls, having a system for supporting a plurality of detector modules for detecting said defects, which system comprises, a plurality of sledge units each carrying one of said detector modules, a floating ring member disposed around but spaced from the vehicle, means for connectig said ring member about the body of said vehicle, and means for pivotally connecting the sledge units to said ring member in circumferential side-by-side relationship with each other around said ring member, each sledge unit comprising two or more links connected together for pivotal movement with respect to each other, one of said links being arranged to carry a detector module whilst the link remote from said detector module-carrying link being connected to said ring member by pivotal connecting means, and spring means connected respectively to the remote link and to the detector carrying link and arranged independently to urge the leading trailing edges of the detector module-carrying link outwardly so as to resiliently engage the inner surface of the pipeline wall.

4,105,973

MULTIBEAM, DIGITALLY MODULATED, TIME DIVISION, SWITCHED SATELLITE COMMUNICATIONS SYSTEM

Hamilton Webster Arnold, Tinton Falls; LeRoy Conrad Tillotson, Harrison, both of N.J., and James Arthur Young, Jr., Brazilia, Brazil, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 15, 1976, Ser. No. 732,994

Int. Cl.² H04B 7/20

U.S. Cl. 325—4 **18 Claims**

7. In a multibeam, digitally modulated, time division switched radio communication system including a plurality of ground terminal stations distributed among *n* spaced ground station areas and a remote repeater, each ground terminal station comprising a transmitter, a receiver and a clock circuit for controlling the bit transmission frequency of the transmitter, the remote repeater comprising *n* transponders, and a master clock circuit for controlling the system transmissions, a method of synchronizing and switching the signals from the *n* ground station areas through the repeater comprising the steps of:

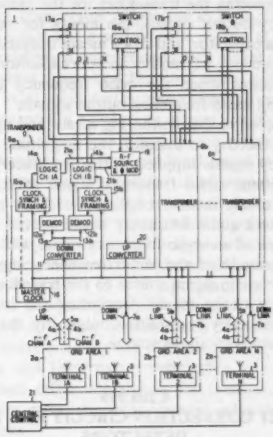
(a) generating at each transponder in response to signals from the repeater master clock a first and a second digital code in predetermined bits of a first section of a first repetitive digital subframe sequence with each subframe comprising *w* bits, the first digital code providing an indication of the start of each subframe sequence and the second digital code providing an indication of the subframe number within a frame of s subframes;

(b) generating at each ground terminal station for transmission to the repeater a series of N second digital synchronizing subframes, each subframe comprising *y* bits, where *y* is a submultiple of *w*−1, and including both a first section of comparative length to said first section of said first subframe sequence comprising said first and second digital codes in corresponding bits positions within said first section and a second section comprising a third digital code for sequentially identifying each of the second subframes within said series of N second subframes, the number of bits necessary for the first and second subframe series to be repeated being determined by the equation

$$M \times sw = N \times y$$

where M is the number of frames of said first subframe series;

(c) at each transponder, transmitting back to the associated ground terminal station a sequence of *w* bits comprising



the transponder generated digital codes for the first and second portions of said first subframe section followed by the received synchronizing subframe series in said second section whenever the transponder detects both a match between the transponder generated digital code for the first portion of each first subframe section and the synchronous bits in the received bitstream and a mismatch between the transponder generated digital code for the second portion of each first subframe section and the synchronous bits in the received bitstream;

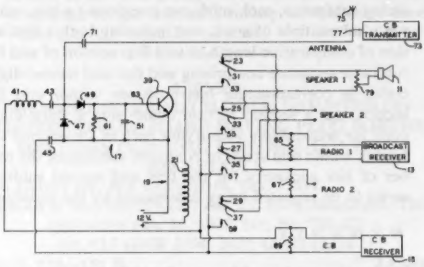
(d) determining at each ground terminal station from the signals received from the associated repeater transponder the number T of the first synchronizing subframe in said received second subframe section causing said repeater transmission in step (c) coincident with the normal reception at the repeater of the first subframe in said frame of *s* subframes in the first subframe series in accordance with the digital code in the second portion of each first subframe section; and

(e) incrementing a bit counter maintaining a count of the transmitted bits in the second subframe series by a value equal to $(N-t) \times y$ to effect frame and subframe synchronization at each ground terminal station.

4,105,974
PRIORITY INTERRUPT CIRCUIT

Edwin F. Rogers, P.O. Box 186, Syracuse, Ind. 46567

Filed Oct. 14, 1975, Ser. No. 621,823
Int. Cl.[2] H04B 1/38
U.S. Cl. 325—21 11 Claims



5. In a system including a radio frequency transmitter, an electroacoustic transducer, and an audio signal source for supplying audio frequency signals to the transducer, the improvement comprising:

means monitoring the transmitter for the presence of radio frequency output signals, the means for monitoring including a capacitor, and diode means coupled between the radio frequency transmitter and the capacitor for charging the capacitor when the radio frequency transmitter is producing radio frequency output signals;

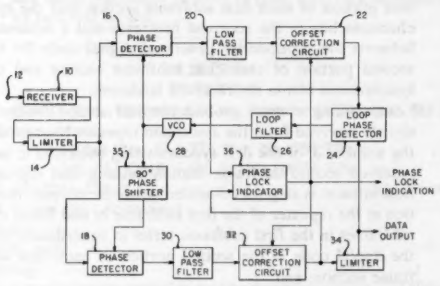
means coupled to the monitoring means and operable when enabled thereby to diminish the magnitude of the audio frequency signals supplied to the transducer; and

an intermittent audio frequency signal source, radio frequency choke means coupling the diode means to the intermittent audio frequency signal source whereby the occurence of an audio frequency signal will also diminish the magnitude of the audio frequency signals supplied from the audio signal source to the transducer, the radio frequency choke means preventing the loading of the radio frequency transmitter output by the intermittent audio frequency signal source.

4,105,975
OFFSET CORRECTION CIRCUIT FOR PHASE DETECTORS

David E. Sanders, St. Petersburg; Ramon P. Chambers, Clearwater, and Robert S. Gordy, Largo, all of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 1, 1977, Ser. No. 764,604
Int. Cl.[2] H04L 27/22
U.S. Cl. 325—320 8 Claims



1. An error correction circuit comprising:

a phase detector means for providing a signal at its output indicative of a relationship between signals on its inputs;

means for providing a correction signal, which signal is a positive going signal in response to one state of a control signal and a negative going signal in response to another state of the control signal;

a comparison means for comparing said correction signal with the signal present at the output of said phase detector to generate said control signal, the state of which is said one state when said correction signal is below the signal at the output of said phase detector and of said another state when said correction signal is above the signal at the output of said phase detector;

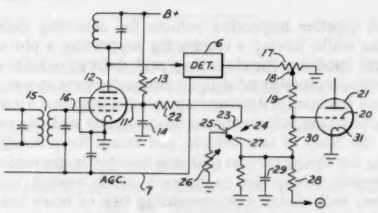
means for subtracting said correction signal from the signal provided by said phase detector means to provide an error corrected signal for correcting errors inherent in said phase detector means; and

means for maintaining said correction signal substantially constant during a selected operating condition of said phase detector means.

4,105,976
AUTOMATIC GAIN CONTROL

Floyd Payden, 312 W. State St., Fremont, Ohio 43429

Filed Dec. 1, 1976, Ser. No. 746,259
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—404 2 Claims



1. An automatic gain control system for a radio receiver comprising, in combination, an intermediate frequency amplifier, a detector connected to the intermediate frequency amplifier, an automatic gain control lead from the detector connected to the intermediate frequency amplifier to vary the amplification generally inversely as the amplitude of the signal applied to the detector, a potentiometer connected to the detector to serve as a volume control, an audio frequency amplifier having an input terminal, a resistor connecting the input terminal to the slider of the potentiometer, an element of the intermediate frequency amplifier having a potential that varies with the potential on the automatic gain control lead, a voltage divider comprising a first resistor and a variable resistor connected between said element and a circuit ground, a semiconductor breakdown device and a second resistor in series connected in parallel with said variable resistor, a third resistor connecting said input terminal to the junction of said semiconductor breakdown device and second resistor, and a fourth resistor connecting said junction to a source of negative potential, whereby the potential of said input terminal varies with the amplitude of the signal of the intermediate amplifier to maintain a constant audio signal from said audio frequency amplifier.

4,105,977
ADAPTIVE UNDESIRED SIGNAL CANCELLER

Robert C. Fitting, and Gregory H. Piesinger, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

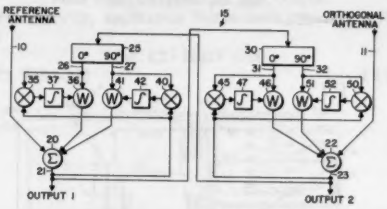
Filed Mar. 10, 1977, Ser. No. 776,141
Int. Cl.[2] H04B 1/12
U.S. Cl. 325—472 6 Claims

3. An adaptive undesired signal canceller comprising:

a. first summing means adapted to receive a first signal accompanying a portion of a second signal;

b. second summing means adapted to receive the second signal accompanying a portion of the first signal;

c. first means coupling a portion of a signal from the output of said second summing means to said first summing means for substantially cancelling the portion of the second signal accompanying the first signal therein;



d. second means coupling a portion of a signal from the output of said first summing means to said second summing means for substantially cancelling the portion of the first signal accompanying the second signal therein; and

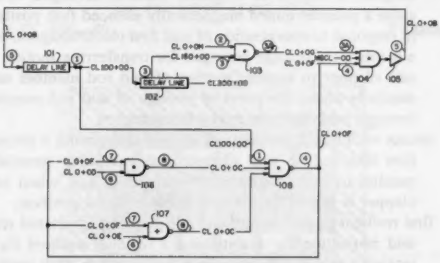
e. said first and second means each including quadrature means for splitting signals applied thereto into an in-phase and quadrature component and weighting means for adjusting the amplitude of each component.

4,105,978

STRETCH AND STALL CLOCK

Gary J. Goss, Acton, and Thomas F. Joyce, Burlington, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Aug. 2, 1976, Ser. No. 710,540
Int. Cl.[2] H03K *5/04, 1/18*
U.S. Cl. 328—58 **9 Claims**



1. A stretch and stall clock circuit means comprising:

(a) a first electronic means for delaying an electronic signal by a first pre-determined amount of time;

(b) a second electronic means coupled to said first electronic means for delaying the electronic signal by a second pre-determined amount of time;

(c) a third electronic means coupled to said first electronic means for generating first alternating square wave signals having a pre-determined time period T_1; and

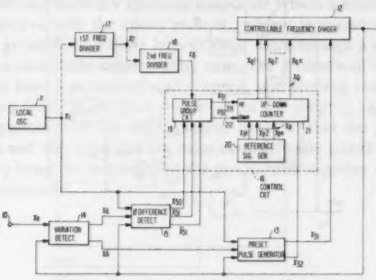
(d) a fourth electronic means coupled to said first, second, and third electronic means and responsive to a first request signal for increasing the time period T_1 of the first alternating square wave signals by a pre-determined amount.

4,105,979

CLOCK REGENERATOR COMPRISING A FREQUENCY DIVIDER CONTROLLED BY AN UP-DOWN COUNTER

Kouzou Kage, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 2, 1977, Ser. No. 792,952
Claims priority, application Japan, May 10, 1976, 51-53424
Int. Cl.[2] H03K *5/01, 3/64*
U.S. Cl. 328—164 **5 Claims**



1. In a clock regenerator responsive to an input data signal taking one of a first and a second state during at least one bit period for producing a regenerated clock signal of a regenerated clock period phase-synchronized with said bit period, comprising a local oscillator for generating a local signal of a frequency substantially equal to an integral multiple of the bit frequency of said input data signal, a controllable frequency divider for frequency dividing said local signal at a frequency division ratio into said regenerated clock signal, first means responsive to said input data and regenerated clock signals for producing an incoincidence signal when a point of variation between said first and second states appears during one of the successive regenerated clock periods in said input data signal, second means responsive to said input data and regenerated clock signals for producing a phase difference signal representative of a phase difference between each of the successive bit periods and a corresponding one of the successive regenerated clock periods, and third means responsive to said incoincidence and phase difference signals for controlling said frequency division ratio, the improvement wherein said third means comprises

pulse group means responsive to said phase difference signal for producing a pulse group of at least one pulse of a number indicative of said phase difference, and

control means responsive to said pulse group and the incoincidence signal produced within the regenerated clock period for which said pulse group is produced for controlling said frequency division ratio.

4,105,980

GLITCH FILTER CIRCUIT

Robert Lewis Cowardin, Cary, and George Joseph Laurer, Raleigh, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1977, Ser. No. 809,965
Int. Cl.[2] H03K *13/32*
U.S. Cl. 328—165 **4 Claims**

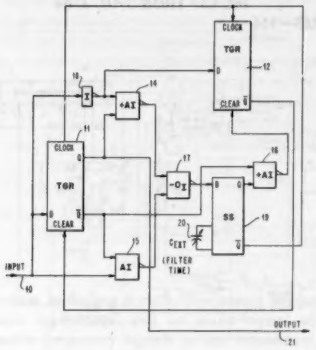
1. A filter circuit for removing glitches which may include dropouts or noise spikes from a pulse-like input signal comprising:

a delay circuit responsive to the leading and trailing edges of the said pulse-like input signal for providing a first control signal a predetermined time after the said leading and trailing edges of the pulse-like input signal;

a first trigger circuit responsive to the input signal and the

control signal for providing a first output when the input signal is in a first state at receipt of the first control signal;

a second trigger circuit responsive to the input signal and the control signal for assuming a first state and providing a second control signal when the input signal is in a second state at receipt of the first control signal;



means for applying the second control signal to said first trigger circuit to cause said first trigger circuit to provide a second output, said first and second outputs being a filtered replica of the input signal; and

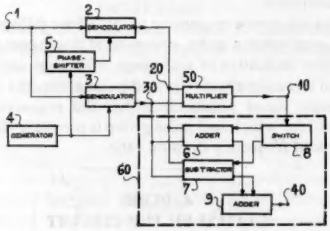
means responsive to the inverse of the second output and the first control signal for resetting said second trigger circuit to a second state.

4,105,981

SYNCHRONOUS DEMODULATION DEVICE

René Lechevin, and Henri Butin, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 14, 1977, Ser. No. 842,324
Claims priority, application France, Oct. 19, 1976, 76 31354
Int. Cl.² H03D *3/18*
U.S. Cl. 329—50 **3 Claims**



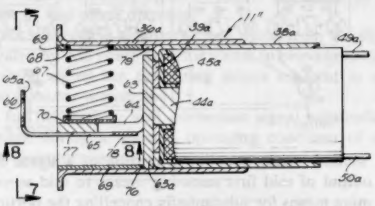
1. A synchronous demodulation device for demodulating a double sideband amplitude-modulated signal and comprising: two synchronous demodulators having respective signal inputs for receiving in parallel said signal, auxiliary inputs, and outputs; a local generator having an output for supplying in phase quadrature said auxiliary inputs with a signal whose frequency is equal to that of the carrier of said signal; means for adding and subtracting the output signals from said two demodulators, means for determining the sign of the product of said output signals and means for controlling, as a function of said sign, said adding and subtracting means whose output constitutes the output of said device.

4,105,982

VACUUM RELAY WITH REDUCED SENSITIVITY TO MANUFACTURING TOLERANCES AND OPTIONAL LATCHING FEATURE

Joseph E. Oeschger, Palo Alto, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,681
Int. Cl.² H01H *1/66*
U.S. Cl. 335—151 **3 Claims**



1. A relay comprising:

an axially elongated enclosure having a longitudinally extending axis and including at least one internally disposed fixed contact and a fixed external terminal conductively connected to said contact, said enclosure having a flexible conductive diaphragm at one end thereof;

a conductive switching rod member passing through said disphragm generally normal to the plan thereof and being mechanically and electrically connected thereto, said rod member extending externally and also generally axially within said enclosure, said rod member providing switching action in cooperation with said fixed contact as a function of variation of the angular position of said rod member with respect to said axis of said enclosure;

an actuator device connected to the portion of said rod member external to said enclosure to control said angular position of said rod member to effect switching action between said rod member and said fixed contact;

means within said actuator including at least a first electromagnet, a clapper of magnetic material arranged to assume a predetermined magnetically induced first position in response to energization of said first electromagnet, and a mechanical linkage arranged for transferring motion of said clapper to angular motion of said rod member substantially about the point of passage of said rod member through said diaphragm as a fulcrum;

means within said mechanical linkage comprising a projection attached to said clapper and extending generally parallel to said longitudinally extending axis when said clapper is in said first magnetically induced position;

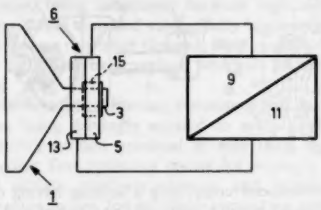
first resilient means comprising a leaf spring associated with said projection for maintaining a residual resilient force retaining said rod member in a first position with respect to said fixed contact while said clapper is in said first magnetically induced position, said leaf spring having an orthogonally turned second end with a hole therethrough receiving said rod member, said leaf spring being arranged to deflect with respect to said projection, thereby maintaining residual resilient force against said rod member in its first position when said clapper is in said magnetically induced position;

and second resilient means associated with said mechanical linkage for maintaining a residual resilient force retaining said rod member in a second position with respect to said fixed contact while said clapper is in a second position corresponding to deenergization of said electromagnet, said second resilient means also serving to separate said clapper from the pole piece of said electromagnet.

4,105,983
STATIC CONVERGENCE UNIT, AND A COLOR DISPLAY TUBE COMPRISING A CONVERGENCE UNIT HAVING PERMANENT MAGNETS

Piet Gerard Joseph Barten, and Jan Bijma, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,487
Claims priority, application Netherlands, Apr. 1, 1975, 75 03830
Int. Cl.[2] H01F *1/00*
U.S. Cl. 335—212 4 Claims

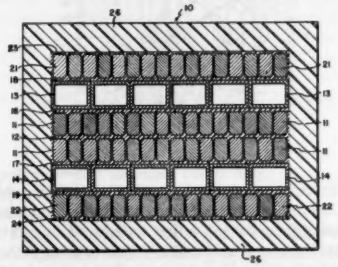


1. An in-line color display tube comprising a neck, an electron gun means disposed in said neck for generating in-line electron beams, and a non-mechanically adjustable device means for the static convergence of the three electron beams, the device comprising at the most two permanent magnetic rings disposed proximate said neck, said device means generating a multiple magnetic field before any deflection of said beams, magnetic intensity and polarization being adapted to correct for convergence errors occurring in the electron beams of the in-line display tube to be converged.

4,105,984
HIGH VOLTAGE DEVICE CONTAINING A FLEXIBLE PREPREG

James D. B. Smith, Turtle Creek, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 372,719, Jun. 22, 1973, Pat. No. 3,960,803.
This application Mar. 2, 1976, Ser. No. 663,036
Int. Cl.[2] H01F *27/08, 27/30*
U.S. Cl. 336—60 7 Claims



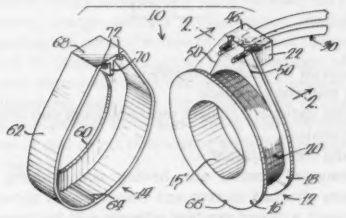
1. A high voltage electrical device comprising a plurality of high voltage coil strips having a groundwall insulation therearound, said coils having adjacent thereto and being bonded together by at least one prepreg comprising a fibrous mat containing an ungelled prepreg resin comprising epoxy resin having an epoxy equivalent weight greater than about 350 and at least one sterically hindered anhydride, and said groundwall having impregnated therethrough a styrene-epoxy-anhydride impregnating resin, the groundwall contacting at least a portion of said prepreg, said prepreg resin comprising from 25 wt.% to 500 wt.% of the prepreg and being compatible with the impregnating resin, so that the prepreg resin and the impregnating resin can be finally cured to integrally bond the prepreg and the groundwall together without delamination.

4. A high voltage electrical device comprising a plurality of high voltage coil strips and inner-cooling channels having a groundwall insulation therearound, said coils and channels having adjacent thereto and being bonded together by at least one prepreg comprising a fibrous mat material containing an ungelled prepreg resin consisting essentially of epoxy resin having an epoxy equivalent weight greater than about 350 and at least one sterically hindered anhydride which is substantially unreactive with the epoxy resin at ambient temperatures, and said groundwall having impregnated therethrough a styrene-epoxy-anhydride impregnating resin, the groundwall contacting at least a portion of said prepreg, said prepreg resin comprising from 25 wt.% to 500 wt.% of the prepreg and being compatible with the impregnating resin, so that the prepreg resin and the impregnating resin can be finally cured to integrally bond the prepreg and the groundwall together without delamination.

4,105,985
LEAD ATTACHMENT MEANS AND METHOD FOR MAKING ELECTRICAL COILS

James P. Plunkett, West Dundee, Ill., assignor to Coils, Inc., Huntley, Ill.

Filed Feb. 24, 1977, Ser. No. 771,686
Int. Cl.[2] H01F *15/10*
U.S. Cl. 336—90 6 Claims

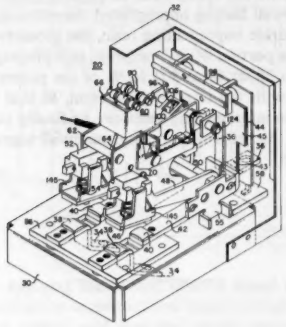


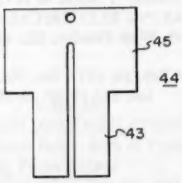
1. In an electrical coil including a bobbin having central portion and a pair of spaced parallel flanges extending radially from said central portion with a coil of wire wound upon said central portion between said flanges, said coil of wire having opposite free exposed ends, a terminal block extending from a surface of one flange and having a pair of elongated openings extending through said block and said one flange, said terminal block having a pair of holes respectively located adjacent the respective openings, a pair of terminal leads respectively received in said openings and each having an exposed conductor portion located between said flanges with said conductor portions respectively connected to respective free exposed ends of said wire, and a pair of metal rods respectively located in said holes and extending from said block to have free ends located between said flanges, said metal rods being located in juxtaposed relation to the respective exposed conductor portions and secured thereto to maintain said terminal leads in said openings.

4,105,986
DISTRIBUTION TRANSFORMER SECONDARY CIRCUIT INTERRUPTER HAVING AN IMPROVED BIMETAL

Theodore Gogniat, Monroeville, Pa., and John F. Cotton, Athens, Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 582,562, May 30, 1975, abandoned.
This application Nov. 24, 1976, Ser. No. 744,860
Int. Cl.[2] H01H *37/52, 71/16*
U.S. Cl. 337—3 6 Claims



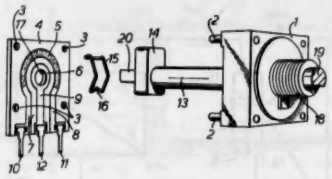


1. A circuit interrupter comprising:
a first stationary contact;
a second stationary contact separated from said first stationary contact;
bridging contact means;
an elongated contact arm having said bridging contact means attached thereto and being pivotal about an axis between a closed position wherein said bridging contact means completes an electric circuit between said first stationary contact and said second stationary contact and an open position wherein said bridging contact means is spaced apart from said first stationary contact and said second stationary contact;
primary latch means connected to said elongated contact arm and, when in a latching position, latching said elongated contact arm in the closed position;
a secondary latch when in a latching position keeping said primary latch means in the latching position; and,
planar bimetal actuating means comprising an elongated planar bimetal held relatively stationary at one end and being responsive to current flow therethrough and ambient oil temperature to deflect at the other end and unlatch said secondary latch when current flow through the circuit interrupter exceeds a trip level, said elongated planar bimetal being constructed to have a higher power dissipation in proximity to the relatively stationary end than in proximity to the deflecting end.

4,105,987
POTENTIOMETERS

Gordon Spence, Swindon; Cecil Godfrey Hemmens, Purton, and Alan Godfrey, Down Ampney, all of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Dec. 10, 1976, Ser. No. 749,370
Claims priority, application United Kingdom, Dec. 12, 1975, 50992/75; Dec. 12, 1975, 50993/75; Jan. 27, 1976, 2992/76
Int. Cl.[2] H01C *10/16*
U.S. Cl. 338—130 6 Claims

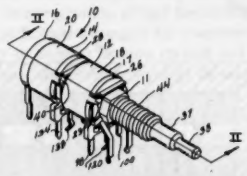


1. A potentiometer comprising a housing having one open end, an insulating board closing said one end of said housing, said insulating board comprising silk-screen printed resistive and highly conductive tracks applied at a surface of said board, an actuating spindle rotatably supported by said housing and including a hollow wiper-carrying part, a saddle-shaped springy metal wire wiper loosely accommodated partially within said hollow wiper-carrying part of the actuating spindle wherein said wiper-carrying part is positioned adjacent said insulating board so that the wiper bridges between said resistive and highly conductive tracks, said wiper comprising at one end thereof overlapping ends of wire which define twin contact positions for engaging said insulating board.

4,105,988
TANDEM ELECTRICAL CONTROL

John D. VanBenthuysen, Elkhart, Ind.; Thomas W. Flanders, Edwardsburg, Mich., and John R. Gietzen, Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Dec. 22, 1976, Ser. No. 753,477
Int. Cl.[2] H01C *10/16*
U.S. Cl. 338—132 29 Claims



1. An electrical control which comprises a shaft support and base unit having a mounting face, having an end distal from said mounting face, having a first unreduced cylindrical bore portion that intercepts said end and that extends orthogonally toward said mounting face, having a first reduced cylindrical bore portion that is smaller in diameter than said first cylindrical bore portion and that coaxially extends from said first unreduced cylindrical bore portion through said mounting face, and having a first shoulder that is concentrically disposed intermediate of said first unreduced and first reduced cylindrical bore portions;
a shaft having a first unreduced diameter portion that is rotatably and supportively carried in said first unreduced cylindrical bore portion, having a first reduced diameter portion that is rotatably and supportively carried in said first reduced cylindrical bore portion and that extends through said mounting face, and having a second shoulder

that is concentrically disposed intermediate of said first reduced and first unreduced diameter portions and that rotatably engages said first shoulder to limit axial movement of said shaft in a first direction;

a driver having front and rear faces, having a driving aperture orthogonally intercepting said front face, being assembled onto said first reduced diameter portion with said front face proximal to said mounting face, and being drivingly secured to said first reduced diameter portion;

means for defining an elongated resistance element along an arcuate path on said mounting face that is substantially concentric with said second cylindrical bore portion;

an arcuate collector member having contacting and back surfaces, being interposed between said unit and said driver, being disposed substantially concentrically inside said arcuate resistance element, and being attached to said unit with said back surface proximal to said mounting face;

a contactor member having contacting and mounting surfaces, being drivingly secured to said driver with said mounting surface proximal to said front face thereof, including first contactor means for wipingly contacting said arcuate resistance element, and including second contactor means for wipingly contacting said collector member;

terminal means, being connected to said resistance element and to said collector member, for connecting said resistance element and said collector member to an electrical circuit; and

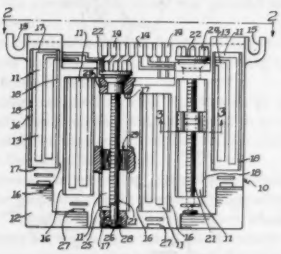
means, including said driver, for limiting axial movement of said shaft in a second direction.

4,105,989

UHF SUBSTRATE TUNER POTENTIOMETER

Branimir Kesic, Park Ridge, and Charles P. Pytlarz, Elmwood Park, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 8, 1976, Ser. No. 740,162
Int. Cl.[2] H01C *10/40*
U.S. Cl. 338—180 **3 Claims**



1. A potentiometer assembly comprising:

a housing having an elongated compartment, said compartment including a pair of opposed longitudinal side walls and a pair of opposed transversely extending end walls, each of said side walls including a longitudinal rib extending between said end walls and projecting within said compartment;

a resistive element associated with said compartment;

a replaceable carriage member slidably maintained within said compartment and carrying a contact member for engaging said resistive element, said carriage member comprising an outer generally U-shaped portion having a base and a pair of flexible arms extending therefrom, each of said flexible arms having an exterior longitudinal groove coacting with one of said ribs such that a uniform transverse force is exerted against said flexible arms by said ribs causing a slight inward flexing thereof for supporting and stabilizing the position of said carriage member relative to said compartment; and

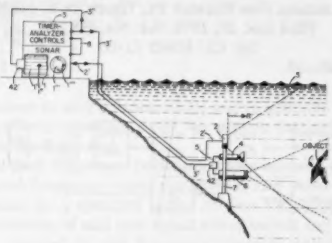
a threaded shaft removably associated with and longitudinally disposed within said compartment, said threaded shaft being operable for driving said carriage member within said compartment whereby, said contact member is displaced along said resistive element.

4,105,990

PROCESS OF AND APPARATUS FOR EXPLORING OBJECTS DETECTED BY DIFFERENT ENERGY SOURCES

Robert H. Rines, Boston, and Duane Marshall, Lexington, both of Mass., assignors to The Academy of Applied Science Inc., Boston, Mass.

Filed Sep. 13, 1976, Ser. No. 719,381
Int. Cl.[2] G01S *9/66, 7/60*
U.S. Cl. 340—3 R **35 Claims**



1. A process of exploring the presence of objects in a medium propagating one type of energy more facilely than a second type of energy, that comprises, directing energy of said one type into the medium to reflect and scatter the same from objects in said medium, indicating and analyzing the reflected and scattered energy, determining when the analyzed reflected and scattered energy matches predetermined characteristics corresponding to a particular type of object, and responding to such match by thereupon directing the second type of energy toward said object to reflect and scatter the second type of energy therefrom, indicating the second type of energy reflected and scattered from said object, and correlating the indications of said object obtained by both the first and second types of energy.

4,105,991

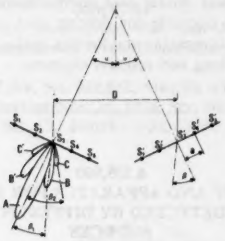
ACOUSTIC WAVE TRANSMITTER-RECEIVER

Robert Delignieres, Mareil Marly, France, assignor to Institut Francais du Petrole, France

Filed Jun. 24, 1976, Ser. No. 699,331
Claims priority, application France, Jul. 7, 1975, 75 21495
Int. Cl.[2] G01S *9/66;* **H04R** *1/40*
U.S. Cl. 340—3 D **8 Claims**

1. An acoustic wave transmitter-receiver device comprising at least one pair of transducer assemblies for transmitting and receiving acoustic waves, the transducers of each assembly being regularly spaced and having their main transmission axes oriented in a direction parallel to a common axis, and the common axes of the two assemblies being arranged symmetrically with respect to a vertical axis, the spacing between the transducers of each assembly being so selected that the projection length of said spacing on the vertical axis is equal to a

whole number of wave lengths of the transmitted acoustic waves, means for generating transmission signals, and means



for transmitting said transmission signals, in phase opposition, to the two transducer assemblies.

4,105,992

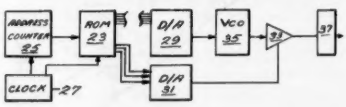
ANIMAL ATTRACTION METHOD AND APPARATUS

David P. Luciano, One Renwick Pl., Ithaca, N.Y. 14850

Filed Jun. 21, 1976, Ser. No. 698,216

Int. Cl.[2] H04B *11/00*

U.S. Cl. 340—15 **4 Claims**



1. An apparatus for attracting mature lactating female animals of a predetermined species comprising:

a digital memory having stored in predetermined locations therein a binary coded digital representation of signals indicative of vocalized sounds given off by young animals for the purpose of attracting mature lactating female animals of said species;

means for generating digital signals indicative of the contents of sequential memory locations and for selectively applying predetermines ones of said signals to first and second converting means;

said first converting means being responsive to selected ones of said digital signals and generating an output signal having a frequency in accordance with the instantaneously applied digital signal; and

said second converting means being responsive to said first converting means output signal and selected ones of said digital signals, for varying the amplitude of said first converter means output signal in accordance with the instantaneously applied digital signal.

4,105,993

METHOD FOR DETERMINING ELASTIC CONSTANTS OF GEOLOGICAL FORMATIONS

Robert Grassy, Bouvron; Dominique Apert, Blain, and Arnaud Etchecopar, Montpellier, all of France, assignors to Services et Instruments de Geophysique, Bouvron, France

Filed Sep. 7, 1976, Ser. No. 720,700

Claims priority, application France, Sep. 9, 1975, 75 27594

Int. Cl.[2] G01V *1/22, 1/28*

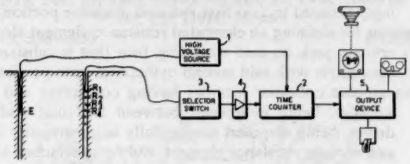
U.S. Cl. 340—15.5 CP **10 Claims**

1. A method for determing the wave propagation velocities of "P" waves and "S" waves through a geological formation from a first bore hole to a second bore hole, the method comprising the steps of:

(a) positioning in the first bore hole a single transmitter for transmitting both "P" and "S" waves,

(b) positioning in the second bore hole a series of receivers for receiving "P" waves, at least one of said receivers being arranged to also receive "S" waves, the receivers being positioned in vertical arrangement at known distances from each other,

(c) transmitting at least one "P" wave from the transmitter and measuring the time for propagation of the "P" wave from the transmitter to each receiver,



(d) calculating the distance between the transmitter and the at least one receiver arranged to also receive "S" waves,

(e) transmitting at least one "S" wave from the transmitter and measuring the time for propagation of the "S" wave from the transmitter to the at least one receiver arranged to also receive "S" waves, and

(f) calculating the propagation velocities of the "P" and "S" waves.

4,105,994

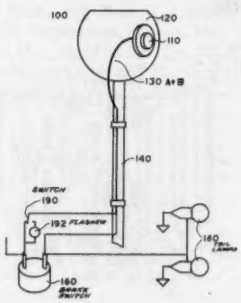
MANUAL DOWNSHIFT DEACCELERATION WARNING LIGHT SYSTEM

Gustave J. Chicoine, 1052 Cumberland Pl., San Jose, Calif. 95125

Division of Ser. No. 659,223, Feb. 19, 1976. This application Jan. 24, 1977, Ser. No. 762,310

Int. Cl.[2] B60Q *1/26;* H01H *3/16, 9/06, 21/10*

U.S. Cl. 340—71 **10 Claims**



1. A device which permits a driver to manually activate vehicle braking indicators during transmission downshift deacceleration while repositioning the shift lever via a shift knob releaseably mounted on the threaded end portion of the shift lever, comprising:

a shift knob having an elongated opening and interior cavity adapted to receive the threaded end portion of the shift lever;

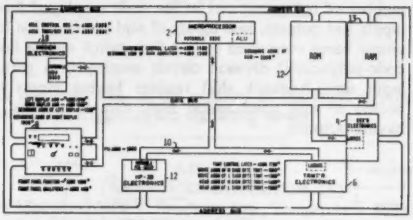
a manually operated switch mounted on the shift knob for activating the vehicle braking indicators;

threaded means adapted to releaseably engage the threaded end portion of the shift lever for securing the shift knob thereto permitting the shift knob to be rotated about the axis of the threaded end portion of the shift lever and to be tilted by sliding the threaded end portion along the elongated opening.

4,105,995
DIGITALLY CONTROLLED TRANSMISSION IMPAIRMENT MEASURING APPARATUS

Delwin L. Bothof, Cupertino; Richard G. Fowles, San Jose; Johann J. Heinzl, Cupertino; David R. Novotny, San Jose; Robert L. Weisickle, San Jose; John H. Wetzel, Santa Clara, and Paul G. Winninghoff, Sunnyvale, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 16, 1976, Ser. No. 697,071
Int. Cl.[2] G08C *25/00*; G06F *11/00*
U.S. Cl. 340—146.1 E **26 Claims**



1. Communication channel measuring apparatus comprising:

two processor controlled machines, each having means for being selectively placed in a master mode and a slave mode and each machine comprising:

a. a bus;

b. control means for generating control code word corresponding to the master mode and the slave mode selection and to a desired measurement function and applying the code word to the bus;

c. a first memory coupled to the bus for storing digital information;

d. a second memory having stored microinstructions and coupled to the bus;

e. a processing unit coupled to the bus for performing operations in response to the microinstructions stored in the second memory, digital information stored in the first memory, the control code word and parallel digital information appearing on the bus;

f. first means coupled to the bus for receiving parallel digital information and converting the parallel digital information to a serial bit stream;

g. a transmitter coupled to the first means to receive the serial bit stream from the first means and to a communication channel for applying a signal to the channel in response to the serial bit stream;

h. second means for receiving a serial bit stream and converting the serial bit stream to parallel digital information;

i. a receiver coupled to the communication channel and to the second means for applying a serial bit stream to the second means in response to receiving a signal on the channel; and

means for coupling each of the processor controlled machines to distal ends of a communication channel to be measured.

4,105,996
DISCONNECTION INDICATING APPARATUS FOR AUTOMOBILES

Akio Shimizu, Tone, Japan, assignor to Niles Parts Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1977, Ser. No. 760,717
Claims priority, application Japan, Aug. 3, 1976, 51/27261
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—73 **1 Claim**

1. A disconnection indicating apparatus for use as an initial activating and turn signal lamp out indicator for automobiles, said apparatus comprising;

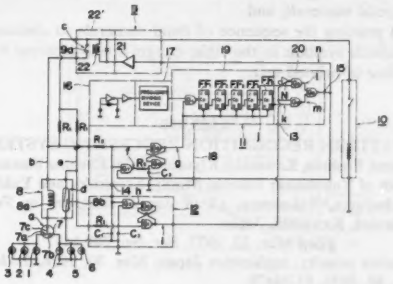
turn signal selecting switch for activating a plurality of selected turn signal lamps;

pulse generation means for generating a continuous stream of electrical pulses at a specified selected frequency;

switch detection means for detecting the operation of said turn signal select switch and thereafter activating said pulse generation means;

intermittent switching means connected to a source of power and adapted to receive said pulses to intermittently switch said power at the frequency of said pulses to intermittently energize said selected turn signal lamps;

current detection means adapted to monitor the flow of



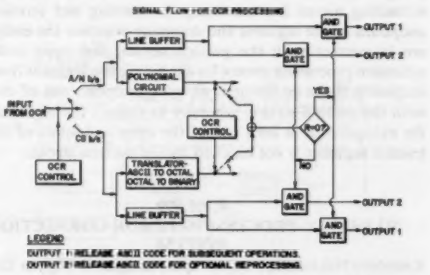
current to said selected lamps and to generate a specified frequency selecting signal in response to changes in said current flow; and

initial flash frequency switching means adapted to select an initial frequency pulse signal from said pulse generation means for a specified period of time following the initial activation of said turn signal select switch and to thereafter respond to said frequency selecting signal from said current detection means to switch between a plurality of stable operational states to select a particular frequency pulse signal from said pulse generation means.

4,105,997
METHOD FOR ACHIEVING ACCURATE OPTICAL CHARACTER READING OF PRINTED TEXT

James W. McGinn, Wheaton, Md., assignor to United States Postal Service, Washington, D.C.

Filed Jan. 12, 1977, Ser. No. 758,742
Int. Cl.[2] G06K *9/18*
U.S. Cl. 340—146.3 ED **9 Claims**



1. A method of adding check symbols to lines of printed text during the printing process which improves the accuracy of optical character reading of each line of information which comprises:

(a) generating an electrical signal which represents the USASC II code for each alpha-numeric character produced during the printing of a line of text,

(b) assembling the sequence of USASC II code signals so generated in a correctable line buffer,

(c) adding, deleting and replacing USASC II code signals as

appropriate in the correctable line buffer for alphanumeric characters added, deleted and replaced as appropriate in the production of a corrected line of text,

(d) unloading the USASC II code signals in the line buffer by actuating an end of the line gate at the completion of the printing and correction as appropriate of a line of text as a serial bit stream input to a generating polynomial coding circuit,

(e) operating the generating polynomial code circuit to obtain a unique 24-bit remainder,

(f) translating the 24-bit remainder as a sequence of eight octal numerals, and

(g) printing the sequence of octal numerals so obtained as check symbols in the right margin space adjacent to the line of printed text.

4,105,998

PATTERN RECOGNITION PROCESSING SYSTEM

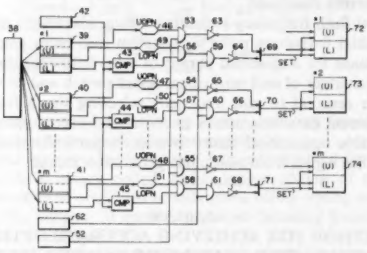
Masumi Yoshida, Kawasaki; Kiyoshi Iwata; Eiichiro Yamamoto, both of Yokohama; Takeshi Masui, Kawasaki, and Yukikazu Kabuyama, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 22, 1977, Ser. No. 780,111

Claims priority, application Japan, Mar. 30, 1976, 51-34672; Mar. 30, 1976, 51-34678

Int. Cl.[2] G06K *9/12*

U.S. Cl. 340—146.3 AC **10 Claims**



1. A pattern recognition processing system in which a pattern to be recognized is scanned to extract, as an imaginary segment, a white area defined between figure strokes and between the pattern stroke and circumscribed frame for the recognition of the pattern, said system comprising segment extracting means for extracting the starting and terminating endpoints of the segment and detecting whether the endpoints are in contact with the pattern stroke, and open endpoint extension processing means for extending the segment from the endpoints if the endpoint is an open endpoint out of contact with the pattern stroke, whereby to extract the segment that the extension of at least one of the open endpoints of the extracted segment is not blocked by the pattern stroke.

4,105,999

PARALLEL-PROCESSING ERROR CORRECTION SYSTEM

Katsuhiro Nakamura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1977, Ser. No. 756,923

Claims priority, application Japan, Jan. 12, 1976, 51-2586

Int. Cl.[2] G06F *11/12*

U.S. Cl. 340—146.1 AL **6 Claims**

1. A parallel-processing error correction system for a data transmission system employing a cyclic error correcting code comprising:

a plurality of data input lines;

a plurality of null input lines;

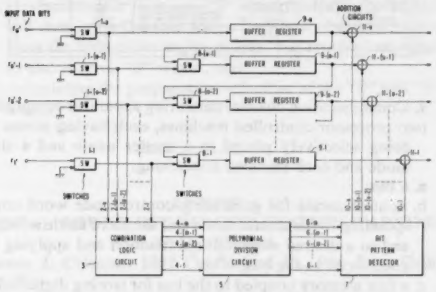
a plurality of first switches, each having first and second inputs connected respectively to said data input lines and said null input lines, and having outputs;

a plurality of second switches, each having first and second inputs and an output, the first inputs of said second switches being connected to corresponding first switch outputs;

a plurality of serial buffer registers having inputs connected to said second switch output lines for storing a bit train fed in parallel therethrough, and having outputs connected to each of said second switches second inputs;

a combination logic circuit for converting said bit train into bit patterns of a length determined depending on the number of redundant bits in the code employed having inputs and outputs, said inputs of said combination logic circuit being connected to said first switch output lines;

a code-polynomial division circuit employing a parallel-input serial-feedback shift register having inputs connected to said combination logic circuit outputs, and having outputs;



a bit pattern detector having inputs connected to said code-polynomial division circuit outputs for detecting particular bit patterns out of the output of the division circuit, and having outputs;

a correcting circuit connected to said buffer register outputs and to said bit-pattern detector outputs for correcting the bit sequence read out in parallel with the buffer registers in synchronism with the output of said detector;

wherein said first switches are operable to selectively connect either one of the data input lines or one of said null input lines to the combination circuit; and

said second switches are each operable to selectively connect either one of the output lines from the first switches or one of the output lines of the buffer registers to said switch output line;

whereby the system is effectively operable even where the number of parallel input bits are changed simply by the operation of the first and second switches depending upon the change in the number of parallel input bits.

4,106,000

ANTI-THEFT DEVICE WITH DISABLING MEANS

Jean Maillot, Paris, France, assignor to Paulette Guterman, Gif sur Yvette, France

Filed Apr. 9, 1976, Ser. No. 675,514

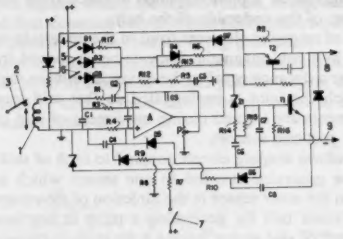
Claims priority, application France, Dec. 23, 1975, 75 39551

Int. Cl.[2] G08B *13/00*

U.S. Cl. 340—530 **13 Claims**

1. A detector device, in particular an anti-theft device, comprising a sensing means connected to the input of an electronic circuit for triggering a signalling means at the output of the device, the device being characterized in that the electronic circuit comprises a difference amplifier whose two input terminals (−) and (+) are connected to the sensing means, said input terminals also being connected by means of at least two switching means to voltage sources in such a way that, by closing one of the switching means, the polarity of the input

terminal in question is reversed, to disable the detector device, and, by closing the other switching means, there is an increase,



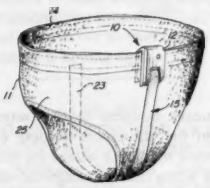
with the same sign, in the polarity of the input terminal in question, for triggering the signalling means.

4,106,001

MOISTURE DETECTOR

Kurt Mahoney, 2600 E. Southern Ave., Tempe, Ariz. 85282

Filed May 12, 1977, Ser. No. 796,130
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—604 **8 Claims**



1. A device for detecting unintentional urination comprising:
a housing for attaching to an undergarment,
said housing containing an audio alarm means and having an outer surface thereof contoured to provide an indentation for receiving therein in surface contact therewith one end of a strip of flexible material,
an elongated narrow strip of flexible, electrically insulating material having an inner face and an outer face,
said strip containing a pair of spaced conductors extending longitudinally thereof along at least a part of its length with a surface of each conductor being exposed on the inner face of said strip,
adhesive means on said inner face of said strip along at least a part of its length
for adhering to the outer surface of the contour of said housing,
a pair of contacts extending from within said housing through said surface of the contour for each engaging the exposed surface of a different one of said conductors, and
means mounted within said housing for connection to said contacts and to said alarm means and actuated by urine occurring on the adhesive side of said strip bridging said electrodes which energizes said alarm means to provide an audible sound.

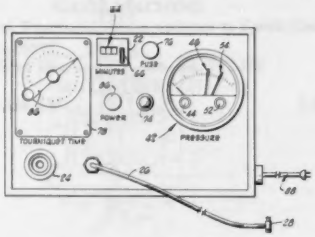
4,106,002

TOURNIQUET PRESSURE MONITOR

Robert J. Hogue, Jr., 1809 NW. 47th St., Gainesville, Fla. 32605

Filed Dec. 6, 1976, Ser. No. 747,938
Int. Cl.[2] G08B *19/00*; A61B *17/12*
U.S. Cl. 340—626 **2 Claims**

1. A monitor adapted for use with a pneumatic tourniquet having a pressure supply line, the monitor comprising:
low pressure sensing means connected to the pressure supply line, the low pressure sensing means sensing the pressure in the pressure supply line and providing a low pressure signal when the sensed pressure is below a predetermined minimum pressure and a minimum pressure signal when the sensed pressure is at least equal to the predetermined minimum pressure;
high pressure sensing means connected to the pressure supply line, the high pressure sensing means sensing the pressure in the pressure supply line and providing a high pressure signal when the sensed pressure is above a predetermined maximum pressure;



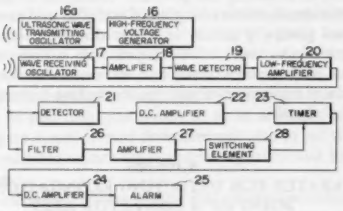
elapsed time indicating means connected to the low pressure sensing means, the elapsed time indicating means receiving the minimum pressure signal and providing a perceivable elapsed time indication indicative of the total time during which the minimum pressure signal has been received; and
alarm means connected to the low pressure sensing means and to the high pressure sensing means, the alarm means receiving the low pressure signal and the high pressure signal and providing a perceivable output indication in response to receiving at least one of the low pressure signal and the high pressure signal.

4,106,003

SIGNAL TREATMENT CIRCUIT FOR BURGLAR ALARMS

Hiroaki Otani, Kawasaki, Japan, assignor to Nippon Prosensor Co., Ltd., Kawasaki, Japan

Filed Dec. 6, 1976, Ser. No. 747,997
Int. Cl.[2] G08B *13/24*
U.S. Cl. 340—530 **7 Claims**



1. In burglar alarms in which a wave receiving oscillator is so arranged to receive an ultrasonic wave signal transmitted from a wave transmitting oscillator when the latter signal is reflected by an object and alarms will ring immediately after obtaining an output by virtue of an input signal caused by a disturbance in a received signal characteristic of an illegal intruder, a signal processing circuit provided with a timer to provide an output only when the above-mentioned input signal continues for longer than a predetermined time, said signal processing circuit further being provided with a switching

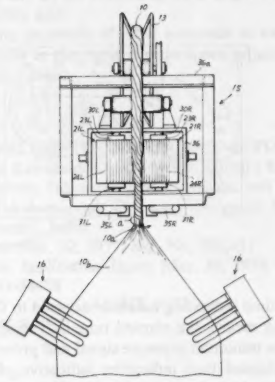
element which will be activated by a high-frequency component in an input signal and is operative to extend said predetermined time.

4,106,004

TWIST DETECTING DEVICE

Mitura Kuroda, 16, Momoyama Mizuno Sakon Higashimachi, Fushimi-ku, Kyoto, Japan (612)

Filed Feb. 16, 1977, Ser. No. 769,321
Int. Cl.² G08B *21/00*
U.S. Cl. 200—61.17 **8 Claims**



1. A twist detecting device for use in a detwisting apparatus for a roped web of knit or woven fabric in a fabric processing system comprising: a pair of sensing drums each having a plurality of axial grooves formed on at least a portion of the circumferential surface thereof, and a rod fixed to another portion of said circumferential surface of each said drum so as to extend laterally therefrom perpendicularly to the axis thereof; said drums being arranged side by side with their respective axes extending in parallel with each other and said grooved surfaces facing in the same direction and said rods extending side by side in parallel with each other; said drums being separated by a space between said grooved surfaces so that said roped web passes through said space in a direction generally parallel with said grooves; means for supporting said drums rotatably about their respective axes so that as said twist in said rope is tightened, engagement of said twisted rope with said grooves on said drums causes simultaneous rotation of said drums and consequently swinging of said rods in the same direction; an actuating bar pivotally connected to said rods so that upon simultaneous swinging of said rods said actuating bar is moved generally axially in either direction, whereby the direction of the twist in said roped web is detected by the direction of movement of said bar; and means for detecting the direction of movement of said bar to produce a corresponding electrical signal.

4,106,005

APPARATUS FOR DETECTING ELONGATION OF A JOINT OF A CONVEYOR BELT

Akira Asakawa, Toyonaka, Japan, assignor to Nippon Konbeya Kabushiki Kaisha, Daito, Japan

Continuation-in-part of Ser. No. 686,667, May 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 597,814, Jul. 21, 1975, abandoned. This application May 13, 1977, Ser. No. 796,829
Int. Cl.² G08B *21/00*; B65G *43/00*
U.S. Cl. 340—676 **6 Claims**

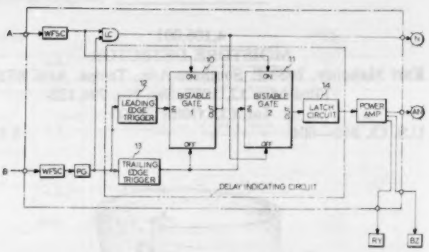
1. An apparatus for detecting elongation of the joint of a conveyor belt, comprising:

a pair of sensors, each of which comprises an iron core having a coil winding therearound and said sensors being spaced at a predetermined distance from each other parallel with the conveyor belt and which distance is greater than the length of the joint along the belt, and said sensors being spaced a predetermined distance from one of the edges of the underside of the belt;

a pair of magnetic elements fixed to the underside surface of the belt, said magnetic elements being spaced from each other a distance equal to the distance between said sensors which the joint is unelongated so that said sensors and elements are aligned during movement of said conveyor belt past said sensors;

a waveform shaping circuit coupled to each of said sensors;

a pulse generator coupled to one sensor which is spaced from the other sensor in the direction of movement of said conveyor belt for generating a pulse in response to the output of said sensor having a duration corresponding to the maximum permissible elongation of the joint of the conveyor belt;



logic circuit means coupled to the outputs of said pulse generator and the waveform shaping circuit coupled to said other sensor including means for activating said logic circuit means when the first magnetic element passes said other sensor and for deactivating the logic circuit means after the first magnetic element passes the one sensor and before the second magnetic element passes said one sensor, and further including means for producing an output when a delay which is longer than the delay corresponding to the maximum permissible elongation of the joint occurs between the output of the waveform shaping circuits; and

means coupled to the logic circuit means and actuated by the output of the logic circuit means for responding to an elongation of the joint which is greater than the maximum permissible elongation.

4,106,006

DUAL-FREQUENCY INDUCTION-KEYED CONTROL CIRCUIT WITH KEYING NETWORK HAVING VARIABLE RESONANT FREQUENCY

Carl E. Atkins, Montclair, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Jan. 26, 1976, Ser. No. 652,465
Int. Cl.² H04Q *3/00*
U.S. Cl. 340—543 **8 Claims**

1. In a multiple-channel induction-keyed control circuit of the type having

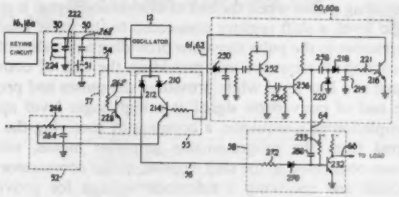
a plurality of passive keying network means, each of said passive keying network means including a tuned circuit having a current — and voltage — controlled variable capacitance, said variable capacitance being operative to vary the resonant frequency of its respective tuned circuit between upper and lower limits, each of said plurality of passive keying networks being resonant at a different frequency from every other of said passive keying networks,

keyable circuit means operative to generate at least first and second constant output signals which, when coupled to a

correctly tuned set of said passive keying networks, is operative in cooperation with said passive keying networks to generate at least first and second modulated output signals where the improvement comprises:

(a) said first constant output signal being generated without said second constant output being generated;

(b) means for generating said first modulated output signal is response to at least one of said passive keying networks coupled to said keyable circuit being tuned to said first constant output signal;



(c) means responsive to said first modulated output signal for turning on said second constant output signal;

(d) means for generating said second modulated output signal in response to at least one of said passive keying networks coupled to said keyable control circuit being tuned to said second constant output signal; and

(e) keying means responsive to said second modulated output for generating a keying signal.

4,106,007

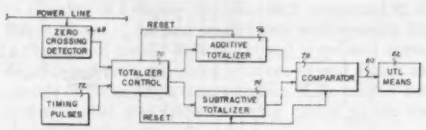
METHOD AND APPARATUS FOR TRANSMITTING INTELLIGENCE OVER A CARRIER WAVE

Reed H. Johnston, Wellesley; Dennis C. Jeffreys, Bedford, and Lawrence J. Stratton, Lexington, all of Mass., assignors to New England Power Service Company, Westborough, Mass.

Continuation-in-part of Ser. No. 489,450, Jul. 17, 1974, abandoned. This application Jul. 1, 1975, Ser. No. 590,941

Int. Cl.[2] H04B *3/54*

U.S. Cl. 340—310 A **73 Claims**



60. A method for modulating a pre-existing alternating voltage wave on a power line, said method comprising the steps of:

1. generating at least first and second signal waves; and,

2. combining said at least first and second signal waves and said pre-existing alternating voltage wave on a power line together in a phase relationship which produces a composite voltage wave having peak amplitudes which depart minimally from the peak amplitudes of said pre-existing alternating voltage wave, said composite voltage wave having a recognizable pattern of variations in the durations of the intervals defined by preselected locations in said composite voltage wave with said pattern of variations representing digital intelligence which is modulated on said pre-existing alternating voltage wave on a power line.

4,106,008

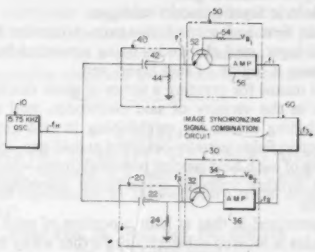
METHOD AND APPARATUS FOR PRODUCING A VERTICAL CENTER LINE AND HORIZONTAL SYNCHRONIZATION SIGNALS FOR TELEVISION TYPE GAME MACHINE

Hiroshi Sakurai, Funabashi, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan

Filed Dec. 3, 1976, Ser. No. 747,332

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—324 AD **6 Claims**



1. Apparatus for producing a center line pulse between horizontal synchronizing pulses for a television type display device which includes a horizontal oscillator generating a horizontal synchronizing frequency and horizontal synchronizing pulses to create a raster scan, said apparatus comprising:

means for supplying a square wave signal synchronized in frequency with said horizontal synchronizing frequency;

first gate means for producing said center line pulse, said first gate means being switchable between a first state providing a relatively high output signal level and a second state providing a relatively low output level signal;

second gate means for producing said horizontal synchronization pulses, said second gate means being switchable between a first state providing a relatively high output signal level and a second state providing a relatively low output signal level;

first means for differentiating said square wave signal and providing positive and negative output signals indicative of the positive going edge and the negative going edge of said square wave at each respective occurrence, said first differentiating means being electrically connected to the input of said first gate means so as to normally bias said first gate means to said first state and also to provide said differentiated square wave output signal to said first gate means;

second means for differentiating said square wave signal and providing positive and negative output signals indicative of the positive going edge and the negative going edge of said square wave at each respective occurrence, said second differentiating means being electrically connected to the input of said second gate means so as to normally bias said second gate means to said second state and also to provide said differentiated square wave output signal to said second gate means; and

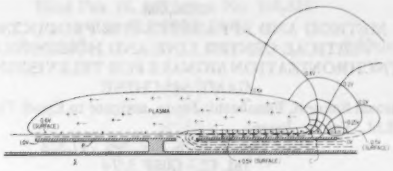
means for electrically combining said output signals of said first gate means and said second gate means into a single output signal as a composite of said center line pulses and said horizontal synchronizing pulses.

4,106,009

SINGLE SUBSTRATE AC PLASMA DISPLAY

George Wilmer Dick, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 17, 1977, Ser. No. 759,892
Int. Cl.² H01J *17/48*
U.S. Cl. 340—343 **15 Claims**



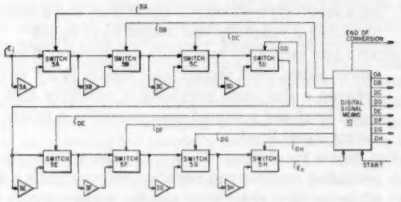
1. Display apparatus comprising,
a body of ionizable gas,
a dielectric layer adjacent said gas,
at least first and second elongate electrodes embedded in said layer, said electrodes being separated by a gap comprising a region of said layer, and
signal means for creating a series of glow discharges in said gas in the vicinity of said electrodes, said signal means including means for establishing in said gap a series of electric fields initially centered at said gap, individual flux lines of each field having potential drops which exceed the gas striking voltages respectively associated with those lines.
characterized in that at least a portion of each of said electrodes is located substantially further away from said gap than is any point on the longest of said lines.

4,106,010

LOGARITHMIC ANALOG-TO-DIGITAL CONVERTER

Donald L. Howlett, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed May 5, 1976, Ser. No. 683,450
Int. Cl.² H03K *13/02*
U.S. Cl. 340—347 AD **4 Claims**



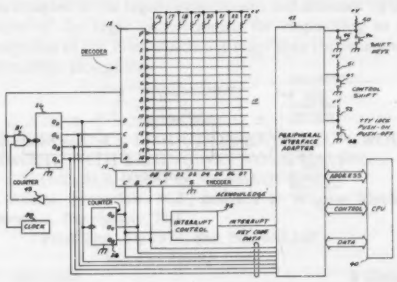
1. A logarithmic analog-to-digital converter comprising receiving means for receiving an analog signal, programmable amplifier means connected to the receiving means and responsive to digital signals for providing an analog signal, and corresponding to a received analog signal, said programmable amplifier means includes a plurality of amplifiers having a first amplifier and a last amplifier, each amplifier having an input, an output and a different predetermined fixed gain of unity or greater; and said first amplifier having its input connected to the receiving means; and a plurality of switching means, having a first switching means and a last switching means, each switching means having two inputs and one output and being controlled by a different digital signal from the digital signal means to pass a signal applied to one input from the one input to the output or to pass another signal applied to the other input from the other input to the output, the one input of each means being connected to the output of a corresponding amplifier and the other input of each switching means, except the first switching means, being connected to the output of a corresponding switching means, the other input of the first switching means being connected to the receiving means, and the output of the last switching means being connected to the digital signal means, so that all the switching means control the amplification of a received analog signal; and digital signal means connected to the programmable amplifier means for providing the digital signals to the programmable amplifier means and as digital outputs corresponding logarithmically to the received analog signal in accordance with the analog signal from the programmable amplifier means, said digital signal means includes a pulse generator providing a pulse signal when an end of conversion signal is at a low logic level and not providing pulses when the end of conversion signal is at a high logic level, a shift register connected to the pulse source and responsive to the pulse signal for providing a plurality of pulses occurring in sequence and providing the end of conversion signal at a low level while providing the pulses and providing the end of conversion signal at a high logic level upon the completion of a sequence, a comparator receiving the analog signal from the programmable amplifier means, switching means connected to the shift register, to the comparator and to ground and receiving a reference voltage for providing a ground connection to the comparator during the occurrence of a first pulse provided by the shift register during the sequence and providing the reference voltage to the comparator during the occurrence of the remaining pulses provided by the shift register, a plurality of flip-flop means, each flip-flop means being connected to the shift register for being responsive to a different pulse provided by the shift register and to the output from the comparator to provide a digital signal to a corresponding switching means in the programmable amplifier so that upon the completion of a sequence the plurality of flip-flop means provides digital signals corresponding logarithmically to the analog input signal.

4,106,011

KEYBOARD CIRCUIT

John Laurence Melanson, Boulder, Colo.; Richard Allen Springer, Beaverton, Oreg.; Jack Duane Grimes, Tualatin, Oreg., and Jack Arthur Gilmore, Aloha, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 24, 1975, Ser. No. 625,611
Int. Cl.² G08C *25/00*
U.S. Cl. 340—365 E **4 Claims**



1. A keyboard circuit for an associated data processing device, comprising:
an array of keys;
means for scanning cyclically said array of keys in a predetermined sequence and generating parallel keycode data corresponding to each key;
interrupt control means for sensing a key depressed for two successive scans and generating an interrupt signal in response thereto; and
means responsive to said interrupt signal for generating an acknowledge signal to stop said scanning at said depressed key on the second of said two successive scans and for

reading and storing keycode data corresponding to said depressed key.

4,106,012
MONITORING IDENTIFIED ELECTRICAL SWITCH CONTACTS

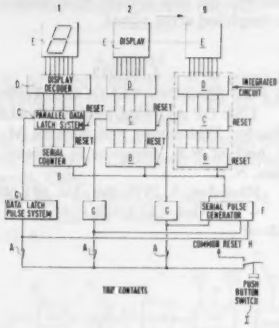
Harry Wilson Knight, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 30, 1976, Ser. No. 718,626

Claims priority, application United Kingdom, Sep. 3, 1975, 36275/75

Int. Cl.² G08B *23/00*; G06M *3/06*

U.S. Cl. 340—523 **2 Claims**



1. A system for monitoring a plurality of identified electric signals and the order in which they occur, comprising in combination:

(a) an electric pulse generator capable of generating an electric pulse in response to the receipt of each of the said electric signals,

(b) a plurality of serial counters each capable of being incremented on receipt of an electric pulse from the said electric pulse generator,

(c) a plurality of a data latch pulse systems each associated with one of the said electric signals and adapted to operate on receipt of the said electric signal,

(d) a plurality of a parallel data latch systems each operable by one of the said data latch pulse systems, and adapted to accept and hold the serial data held in the said serial counter following the receipt of the said electric signal,

(e) a plurality of a display decoders each connected to the output of one of the said parallel data latch systems, and

(f) a plurality of display units connected to the said display decoder and each associated with one of said signals and capable of displaying a representation of the number held in the parallel data latch following receipt of the said electric signal.

4,106,013
ELECTRIC POWER CONTROL SYSTEM WITH LOAD MANAGEMENT PROGRAMMING

Michael Joseph Cronin, Sherman Oaks, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 30, 1976, Ser. No. 755,656

Int. Cl.² G08B *21/00*

U.S. Cl. 340—27 R **9 Claims**

1. An electric power control system comprising:

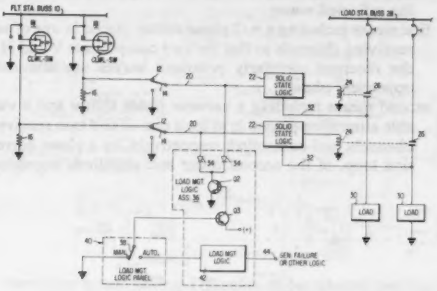
a source of power;

a plurality of electrical loads;

a controller circuit associated with each of said electrical loads and responsive to a control signal to connect the associated one of said plurality of electrical loads to said source of power;

control means remote from said loads for selectively applying control signals to individual ones of said plurality of controller circuits; and,

load management means operable in response to a predetermined condition to cancel the application of a control signal from said control means to a preselected plurality of said controllers as a group and thereby disconnect the corresponding electrical loads from said source of power.



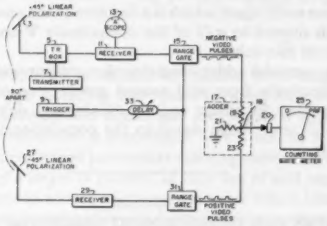
4,106,014
RADAR SET SENSITIVE TO TARGET SHAPE

Ralph L. Dunn, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 26, 1967, Ser. No. 650,156

Int. Cl.² G01S *9/02*

U.S. Cl. 343—5 SA **2 Claims**



1. A pulse radar set comprising; a transmitter and a first receiver which share a common antenna, said first antenna being oriented so as to both launch and receive radar waves plane polarized at an angle of 45° to the earth's surface, a second receiver including a receiving antenna adapted to receive radar waves polarized orthogonally to those transmitted and received by said common antenna, and means connected to the outputs of said receivers to compare the video target echo amplitudes of the two receivers, and wherein said means comprises an adder to which the oppositely polarized outputs of said receivers are applied, and a counting rate meter connected to the output of said adder via a diode.

4,106,015
RADAR SYSTEM WITH CIRCULAR POLARIZED TRANSMISSION AND ADAPTIVE RAIN DEPOLARIZATION COMPENSATION

Daniel E. Beguin, Saint-Prix; Henri J. Bosc, and Jean-Marie H. Colin, both of Paris, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,460

Int. Cl.² G01S *9/60*

U.S. Cl. 343—5 W **11 Claims**

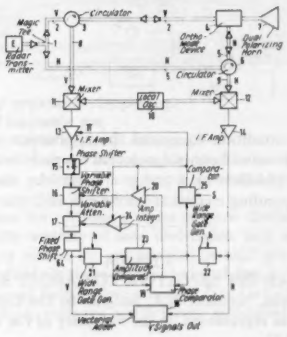
1. An adaptive device for the suppression of the rain echoes

in a radar system transmitting a circularly polarized wave, comprising:

a pair of separate receiving channels which receive, respectively, the mutually orthogonal components V and H of the reflected wave;

first means including a $\pi/2$ phase shifter placed in one of said receiving channels so that the two components V and H of the received circularly polarized waves are nominally oppositely phased;

second means including a variable phase shifter and a variable attenuator placed in at least one of said two receiving channels, and controlled, respectively, by a phase correction loop, of the second order and amplitude correction



loop, of the second order, said phase correction loop comprising a phase comparator whose inputs are connected, respectively, through wide range rain gates, to channel V and to channel H, one of which is corrected, with the output of said phase comparator delivering a phase error signal which is a function of the phase shift $\Delta\phi$ with respect to $\pi/2$ of the components V and H of received rain echo;

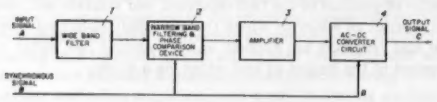
and a vectorial adder receiving the components V and H respectively from said second means, one of which is corrected for phase and amplitude, and delivering the useful target echo signal to the conventional radar circuits.

4,106,016

DEVICES FOR DETERMINING ERRORS OF SITING, ESPECIALLY IN RADAR SYSTEMS

Raffaele Cerra, Via S. Domenico a Corso Europa, 29, and Michele Scherillo, Via Massimo Stanzione, 18, both of 80100 - Naples, Italy

Filed Jul. 29, 1976, Ser. No. 709,803
Claims priority, application Italy, Jul. 30, 1975, 50719 A/75
Int. Cl.² G01S 7/02
U.S. Cl. 343—7.4 **7 Claims**



1. A device for determining aim errors in radar systems through correlation between the radar echo signal and a signal synchronous with the rotation of the antenna comprising,

a first wide-band filtering means which receives the radar echo input signal,

a second means for filtering and phase comparison driven by the antenna rotation signal and being connected in series with said first filtering means and providing a narrow band filtering of said input signal for eliminating noise components whose frequency is different from that of the antenna rotation signal, and for providing phase comparison between said input signal and said antenna rotation signal, and

for generating an output signal that is correlated to the phase difference between said input signal and said antenna rotation signal,

an AC amplifier means connected to said second means for amplifying the output signal,

an AC-DC converter means connected to said AC amplifier means for converting the amplified output signal into two voltage levels having the same value and opposite signs, and

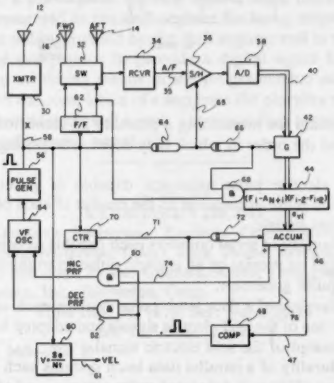
a differential amplifier connected to said AC-DC converter for receiving the two voltage level signals and transmitting an amplified error signal.

4,106,017

SYSTEM FOR SENSING VELOCITY THROUGH THE USE OF ALTIMETRY SIGNALS

Allan W. Roeder, Whitesboro, and Richard M. Kimball, New Hartford, both of N.Y., assignors to General Electric Company, Utica, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,606
Int. Cl.² G01S 9/44
U.S. Cl. 343—8 **8 Claims**



1. A system for determining the relative velocity of two objects in a direction substantially transverse to a line between them comprising, in combination:

transmitting means provided on a first of said objects for illuminating the second of said objects with periodic pulses of wave energy;

receiving means also provided on said first object for receiving and detecting pulses reflected from said second object, said receiving means being adapted to receive reflected energy at a pair of phase center locations spaced apart in said transverse direction;

amplitude correlating means for comparing the amplitude characteristics of each reflected pulse received at a first of said phase center locations with the amplitude characteristics of the reflected pulse received at the other of said phase center locations N pulse repetition intervals earlier in time, said amplitude characteristics being dependent upon the spatial position of each phase center at a time determined by a pulse transmit time and a pulse sample time, said pulse sample time being the time at which the amplitude sample is taken, where the spatial position of the phase center can be modified by modifying the pulse transmit and pulse sample time, said correlating means generating an output signal indicating the degree of correlation between said pulses as determined by the results of said comparisons wherein said correlating means includes

means for generating a correlation output signal representing the error in alignment between the spatial position of said first phase center location and the spatial position of said other phase center location N pulse repetition intervals earlier in time;

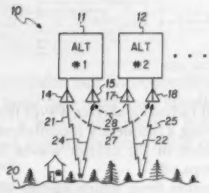
control means to adjust the pulse transmit and pulse sample time of said first phase center relative to the transmit time of the said other phase center location N pulses earlier in time, said adjustment being determined by the level of said output signal controlling a variable frequency oscillator to modify the pulse repetition frequency of said transmitting means; and

means for determining said relative velocity based on the quotient of said phase-center separation distance and N multiplied by said pulse repetition interval.

4,106,018
METHOD AND APPARATUS FOR REDUCING INTERFERENCE BETWEEN PLURAL RADIO ALTIMETERS

Paul P. Chihak, Atkins, and Charles H. Wehage, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 18, 1977, Ser. No. 788,374
Int. Cl.² G01S 9/24
U.S. Cl. 343—12 A **15 Claims**



14. A method of reducing the interference between redundant simultaneously operating CWFM ratio altimeters of the type which transmit a signal and receive a reflection of the transmitted signal, comprising:

detecting a frequency approaching interference signal transmitted by one of said altimeters and received by at least another of said altimeters outside of the bandpass of desired altitude indicating signals of said another of said altimeters, and

stepping a transmitter frequency of said at least another of said altimeters in response to detecting a frequency approaching interference signal.

4,106,019
RANGE RESOLVING DOPPLER RADAR SYSTEM

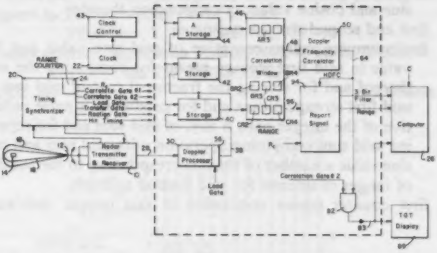
Thomas F. Alexander, Rolling Hills Estates, and Gary J. Griff, Anaheim, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 5, 1972, Ser. No. 298,094
Int. Cl.² G01S 7/44
U.S. Cl. 343—9 **15 Claims**

1. A range determining system responsive to a doppler filter bank having a plurality of doppler filters, said system receiving radar transmission signals for a plurality of dwells over a plurality of range bins, said filter bank providing a filter number signal when a target return signal occurs in a doppler filter, each filter number signal identifying a doppler filter of said bank comprising:

first, second and third storage registers responsive to the doppler filters to store the filter number signals in each range bin for three radar dwells;

recirculating control means coupled to said storage registers for controlling said registers to recirculate the stored filter number signals in said first, second and third registers to unfold target information; and

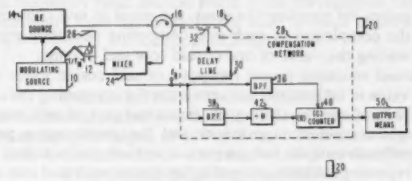


correlator means having a plurality of correlators responsive to said stored filter number signals in said storage registers for detecting an unfolded target signal.

4,106,020
FM-CW RADAR RANGING SYSTEM

Henry Charles Johnson, Neshanic, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,686
Int. Cl.² G01S 9/24
U.S. Cl. 343—14 **11 Claims**



1. In a frequency modulated continuous wave ranging system of the type including: first means for generating a continuous wave interrogation signal, said interrogation signal being frequency modulated in accordance with a desired waveform having predetermined parameters enabling measurement of the range, R, of a target of interest, at least one of said parameters being subject to undesired changes in value which change the measured range; second means for transmitting said interrogation signal to a target and receiving reflected signals from said target; and third means for deriving difference signals indicative of the frequency difference of said reflected signals from the instantaneous frequency of said interrogation signal, said difference signals being indicative of said range; the improvement comprising:

fourth means also responsive to said interrogation signal and said undesired changes therein for deriving difference signals indicative of the distance of a target at a known distance;

fifth means responsive to said difference signals from said third means for determining a parameter of the same representative of target range and responsive to the signals from said fourth means for scaling said parameter.

4,106,021
POLAR TO RECTANGULAR COORDINATE CONVERTER

Kazuo Katagi, Woodland Hills, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,363
Int. Cl.² G01S 7/44, 9/60
U.S. Cl. 343—5 SC **10 Claims**

1. A polar to rectangular coordinate converter which produces, for azimuth values and range values in a polar coordi-

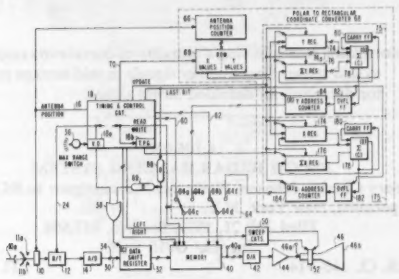
nate system, corresponding row and column values in a rectangular coordinate matrix comprising in combination:

means receptive of a signal indicative of a desired one of said azimuth values for producing fractional trigonometric sine and cosine values corresponding thereto;

first and second storage means;

first summing means receptive of said sine value and the value in said first storage means for computing the sum thereof and for storing the fractional part of said sum in said first storage means and for producing a pulse indicative of the integer part, if any, of said sum and for repeating said sum computing operation with said sum and said sine value a number of times corresponding to the number of ranges of interest for said desired azimuth;

first counter means responsive to said integer indicative



pulses for counting the same, the count in said counter at the completion of each sum computing operation representing the value of one of said row and column;

second summing means receptive of said cosine value and value in said second storage means for computing the sum thereof and for storing the fractional part of said sum in said second storage means and for producing a pulse indicative of the integer part, if any, of said sum and for repeating said sum computing operation with said sum and said cosine value a number of times corresponding to the number of ranges of interest for said desired azimuth; and

second counter means responsive to said integer indicative pulses from said second summing means for counting the same, the count in said counter at the completion of each sum computing operation representing the value of the other of said row and said column.

4,106,022

RADIO POSITION-DETERMINING SYSTEM

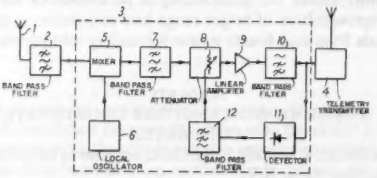
James David Last, Llanfairfechan/Gorddinog, Wales, assignor to University College of North Wales, Bangor, Wales

Continuation-in-part of Ser. No. 496,203, Aug. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 360,060, May 14, 1973, abandoned. This application Jun. 23, 1976, Ser. No. 699,048

Claims priority, application United Kingdom, May 15, 1972, 22775/72

Int. Cl.² G01S *1/30*

U.S. Cl. 343—105 R **18 Claims**



7. A method of location of at least one mobile comprising: transmitting in a fixed phase relation in a cyclic sequence from only one radio navigation transmitter at a time among a set of at least three radio navigation transmitters located at known positions a radio signal at a frequency f_{rf}, receiving said transmitted radio signals at the mobile; generating a signal at a frequency f_0 for use at the mobile; mixing the signals at the frequency f_{rf} and the frequency f_o at the mobile to produce a signal at a frequency f, where f is an audio frequency; transmitting by means of a radio transmitter the signal at the frequency f from the mobile to a control station; and analysing the signals of frequency f received at the control station to determine the position of the mobile.

4,106,023

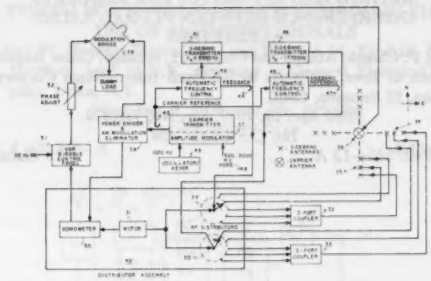
NAVIGATION AID SYSTEM

Elie J. Baghdady, 21 Overlook Dr., Weston, Mass. 02193

Filed Feb. 24, 1975, Ser. No. 552,568

Int. Cl.² G01S *1/38, 1/16, 3/52*

U.S. Cl. 343—106 D **42 Claims**



41. A method of radiating carrier waves from a location, said carrier waves having a frequency modulation dependent on an angle of propagation of the carrier waves from the location, comprising the steps of:

providing a position from which carrier waves are radiated; and,

moving the radiating position along a substantially straight line of motion, the radiating position being repetitively moved at a substantially uniform speed along the line of motion, and the direction of motion being reversed at the ends of the line of motion; whereby an angle of propagation of the carrier waves is determinable solely responsively to the amplitude of the frequency shift in the radiated carrier wave induced by the change in the direction of the motion of the radiating position.

4,106,024

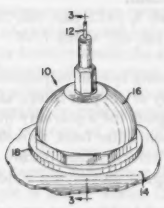
ANTENNA MOUNTING BASE

John Peter Nijman, West Hill, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 28, 1977, Ser. No. 781,737

Int. Cl.² H01Q *1/32, 1/50*

U.S. Cl. 343—715 **12 Claims**



1. A base for mounting a mobile antenna on a support plate and for connecting said antenna to a coaxial cable, comprising: an electrically conductive mounting nut including a longitudinally extending bore to receive a coaxial cable and

means at one end thereof for securing said nut to a support plate;

a dielectric cap to receive and house said mounting nut and including a longitudinally extending bore to receive the central conductor of said coaxial cable;

means cooperating with said cap bore to electrically connect said central conductor to said antenna; and

a clamping element interposed between said mounting nut and said cap to mechanically secure and electrically connect the outer conductor of said coaxial cable to said mounting nut, the frictional engagement between said clamping element and said cap being less than the frictional engagement between said clamping element and said mounting nut with the outer conductor therebetween.

4,106,025

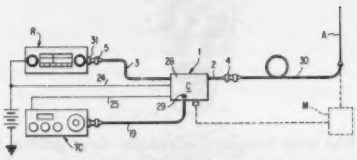
COUPLING CONVERTER FOR VEHICLE ANTENNAS

Sidney Katz, 2113 Fort Worth Ave., Alexandria, Va. 22304

Filed Oct. 22, 1976, Ser. No. 735,039

Int. Cl.² H01Q *1/32, 3/00*

U.S. Cl. 343—715 **10 Claims**



1. A coupling conversion unit for connecting a citizens band transceiver in a broadcast-receiving installation having a broadcast receiver, a broadcast antenna and shielded cable between the antenna and the receiver, said coupling conversion unit comprising:

(a) a base member having

(b) intermediate lead means for connection between said shielded cable and said receiver, said intermediate lead means including

(c) a shielded antenna lead member for connection with said shielded cable and

(d) a shielded receiver lead member for connection with said broadcast receiver,

(e) auxiliary lead means for connection with said citizens band transceiver, said auxiliary lead means including,

(f) impedance matching means and,

(g) a shielded auxiliary lead member;

(h) the shielding conductors of said auxiliary lead member and said antenna and receiver lead members being connected in common,

(i) priority switch means, relay means and overload preventing means responsive to a flow of current to the transceiver to give the transceiver priority over the receiver by immediately electrically connecting exclusively said antenna lead member to the transceiver via said auxiliary lead means whenever the transceiver is activated, said priority switch means including

(j) connecting means for selectively connecting and disconnecting the center conductors of said antenna lead member and said receiver lead member,

(k) positioning means connected to said connecting means for controlling the position of said connecting means whereby the center conductor of said antenna lead member is connected with the center conductor of said auxiliary lead member when the center conductor of said antenna lead member and said receiver lead member are disconnected so that said receiver lead member is electrically isolated from said auxiliary lead member and said antenna lead member whenever the transceiver is activated.

4,106,026

CORRUGATED HORN WITH A LOW STANDING WAVE RATIO

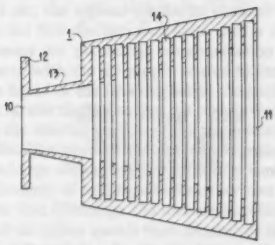
Nhu Bui-Hai, and Alain Bourgeois, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 1, 1976, Ser. No. 737,795

Claims priority, application France, Nov. 4, 1975, 75 33698

Int. Cl.² H01Q *13/02*

U.S. Cl. 343—786 **2 Claims**



1. A corrugated horn of the exponential type, wherein the depth of the corrugations decreases exponentially from the throat of the horn towards its mouth, the extreme depth values of said corrugations are respectively $\lambda/2$ and $\lambda/4$, λ being a wavelength corresponding to a mean frequency of the operational frequency band, and the width of the corrugations varies exponentially from the throat of the horn towards its mouth.

4,106,027

INK FOR THE INK JET PROCESS

Klaus Hoffmann; Rudolf Meyer, both of Leverkusen, and Hans Ohlschlager, Schildgen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 22, 1976, Ser. No. 725,352

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1975, 2543092

Int. Cl.² G01D *15/18;* B41J *27/00;* C09D *11/00*

U.S. Cl. 346—1 **7 Claims**

1. A process for the recording of information on a support by the ink jet method in which a jet of writing liquid having a viscosity of less than 5 cP and an electric conductivity greater than $10^{-4}\,Ohm^{-1}cm^{-1}$ is ejected from a nozzle by the application of pressure and is directed to a receiving surface having a relative component of movement transverse to the direction of jet and in which the jet of writing liquid breaking up into droplets is electrically charged and is modulated according to the information to be recorded, wherein the improvement comprises depositing on a hydrophobic, non-absorbent receiving surface a writing liquid consisting essentially of a dye in a liquid medium consisting of from 85 to 100% of an organic solvent having an evaporation index of less than 11, from 0 to 15% by weight of solvent having an evaporation index greater than 11, **whereby the writing liquid rapidly dries on the hydrophobic surface without causing blockage in the nozzle.**

4,106,028

METHOD AND APPARATUS FOR FORMING MAGNETIC IMAGES BY PIEZOELECTRIC COUPLING BETWEEN AN OPTICAL IMAGE AND A MAGNETOSTRICTIVE IMAGING COMPONENT

Frederick John Jeffers, Escondido; Richard John McClure, San Diego, and James Underwood Lemke, Del Mar, all of Calif., assignors to Eastman Technology, Inc., Rochester, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,878

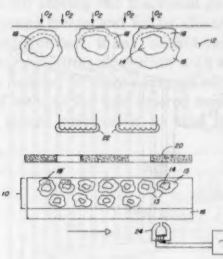
Int. Cl.² G03G *19/00;* G11B *5/00*

U.S. Cl. 346—74.1 **9 Claims**

1. A method for forming a magnetic image on a composite recording layer that includes a photoconductive, piezoelectric

component adapted for converting incident illumination into mechanical strain and a magnetostrictive component rigidly coupled therewith and adapted for varying its coercivity in accordance with communicated mechanical strain comprising the steps of:

forming a surface depletion layer in the surface region of the photoconductive, piezoelectric component;



selectively reducing the depth of said depletion layer in an imagewise pattern; and

magnetizing the magnetostrictive component in the recording layer while said depletion layer is selectively reduced, said magnetization providing a selective magnetic pattern corresponding to said selectively reduced depletion layer pattern, thereby to form a magnetic image.

4,106,029

DEVICE FOR RECORDING MEASURING VALUES

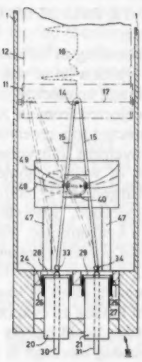
Scato Albarda; Willem Van Der Hoek, both of Eindhoven, Netherlands, and Dominique Yves Marie Taupin, Paris, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 2, 1977, Ser. No. 802,905

Claims priority, application Netherlands, Jun. 15, 1976, 7606436

Int. Cl.² G01D *15/16*

U.S. Cl. 346—117 A **4 Claims**



1. A device for recording measuring values, comprising a transport mechanism for transporting a strip-shaped record carrier in its longitudinal direction, a recording pin which is displaceable in accordance with the variation of the measuring value to be recorded, by means of an electromagnetic drive along a straight line parallel to the surface of the record carrier and perpendicular to the transport direction thereof, and a signal generator which is capable of generating a signal which is dependent of the position of the recording pin, characterized in that the drive (**16**) is formed by two linear motors, the operating directions of which are approximately parallel, each motor comprising a static portion and a moving portion, the moving portion (**26, 27**) of each motor being pivotably connected to an arm (**15**) the said arms being connected to a recording head (**14**) which comprises the recording pin, the signal generator being adapted to generate signals in dependence of the position of the recording pin in the direction of the said line (**17**) as well as in the transport direction of the record carrier (**12**), a control circuit (**60**) being provided which is adapted to control the drive so that substantially no undesired displacement of the recording pin occurs in the transort direction.

4,106,030

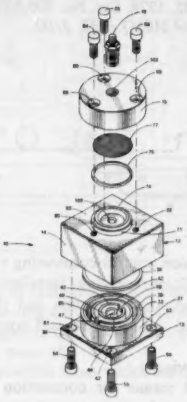
INK JET PRINTER INK HEATER

Perry Dwaine Hampton, Dallas, and Jimmie Lee Tobey, Garland, both of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Feb. 14, 1977, Ser. No. 768,518

Int. Cl.² G01D *15/18*

U.S. Cl. 346—140 R **4 Claims**



1. A fluid temperature control apparatus for an ink jet printer comprising:

a. a structure enclosing a cavity;

b. fluid under pressure circulating into and out of said cavity;

c. a heating element thermally engaged with said fluid within said structure for selectively applying heat to said fluid;

d. a temperature sensing device thermally engaged with said fluid within said structure; and

e. control means responsive to said temperature sensing device at a certain predetermined temperature and connected to said heating element for actuating said heating element to maintain said predetermined temperature, and wherein said structure includes a plurality of circular and concentric flanges extending across said cavity, each flange being provided with a slot to allow said fluid to pass there through, the slot of one flange being located radially opposite of slots of said flanges adjacent thereto.

4,106,031

AUTOMATIC DRAFTING DEVICE

Walter Jozat, Bad Bramstedt, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Mar. 25, 1977, Ser. No. 781,394

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2613440

Int. Cl.² G01D *15/16*

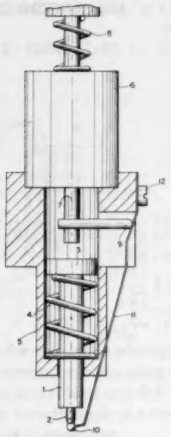
U.S. Cl. 346—140 R **10 Claims**

1. In an automatic drafting device of the type adjustably supporting a tubular writing pen with writing tip in both a lowered writing position with the pen tip contacting the writ-

ing surface and a raised rest position with the pen tip out of contact with the writing surface, the improvment comprising:

A. A housing support for said tubular pen;

B. A rest mode mechanism mounted upon said housing and engaging said pen, so as to urge said pen inwardly of said housing into a raised rest position;



C. A writing mode mechanism mounted upon said housing and engaging said pen, so as to urge said pen outwardly of said housing in a lowered writing position; and

D. A sealing element supported upon said housing, so as to engage the writing tip of said pen in the raised rest position and so as to disengage laterally from the writing tip in a lowered writing position.

4,106,032

APPARATUS FOR APPLYING LIQUID DROPLETS TO A SURFACE BY USING A HIGH SPEED LAMINAR AIR FLOW TO ACCELERATE THE SAME

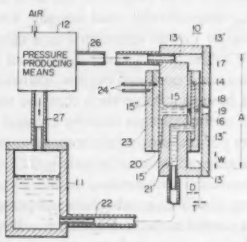
Masayoshi Miura; Kiyoshi Yamamori, and Akira Mizoguchi, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Limited, Japan

Continuation-in-part of Ser. No. 616,636, Sep. 25, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 782,170

Claims priority, application Japan, Sep. 26, 1974, 49-111279; Mar. 20, 1975, 50-34109; Jun. 13, 1975, 50-72555; Jun. 16, 1975, 50-73469

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—140 R **10 Claims**



1. Apparatus for applying liquid droplets to a surface comprising, a housing including a first liquid chamber for containing a liquid to be applied to a surface and having an associated piezoelectric device for generating short-duration rises of the pressure of liquid in the first liquid chamber, a second liquid chamber communicating with the first chamber through a connecting channel and having a first discharge channel for droplets of said liquid to leave the apparatus, the first discharge channel being in alignment with the connecting channel and in close proximity thereto so that a short-diration pressure rise in the first liquid chamber causes a series of liquid droplets of decreasing size to be expelled through the first discharge channel, the second liquid chamber having a first intake channel connected to a liquid supply source, a pneumatic chamber substantially divided into an inner, disc-like portion formed with a second discharge channel and an outer, annular portion formed with a second intake channel connected to a source of pressurized air, the second discharge channel being in alignment with the first discharge channel and in close proximity thereto, means for providing communication for the liquid supply source with the air supply source to increase the pressure in the liquid in the first discharge channel relative to the pressure at an exit thereof so that the pressurized air is admitted firstly into the annular portion of the pneumatic chamber, then into the disc-like portion thereof and expelled through the second discharge channel in the form of a laminar jet stream, whereby droplets of said liquid of smaller size when expelled through the first discharge channel are accelerated by the jet stream of air at higher speeds than droplets of large size so that said series of droplets lands on said surface substantially at the same instant of time, and means for humidifying the air in the pneumatic chamber to maintain the liquidity of the liquid in the first discharge channel.

4,106,033

SYSTEM FOR INDICATING PHOTOGRAPHING CONDITIONS

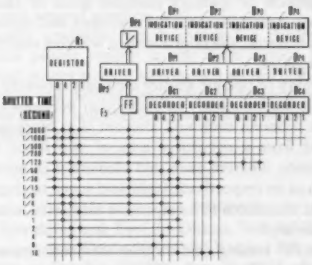
Soichi Nakamoto, Machida; Nobuaki Sakurada, Yokohama; Tadashi Ito, Yokohama; Fumio Ito, Yokohama, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 514,895, Oct. 15, 1974, abandoned. This application Jun. 17, 1976, Ser. No. 697,108

Claims priority, application Japan, Oct. 17, 1973, 48-116577

Int. Cl.[2] G03B *7/08, 17/20*

U.S. Cl. 354—23 D **4 Claims**



1. A photographic information displaying apparatus for a camera comprising:

a register for storing photographic information in digital form, said register generating binary coded signals corresponding to the stored contents;

a decoder for decoding the content of said register, said decoder converting the binary coded signals into decimal-coded signals;

a first indication means for indicating in numerical figures a value corresponding to the output of said decoder;

a second indication means for indicating a fractional sign;

means for detecting whether or not the output signal of the register corresponds to a time shorter than one-half second of the shutter time, said means for hinging the indication means into an indicating state when the output of signal of the register corresponds to a time shorter than one-half second of shutter time;

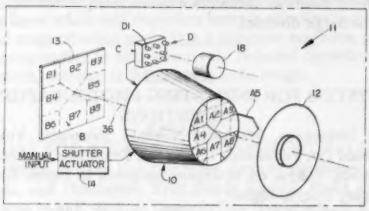
whereby the first indication means indicates a fraction in cooperation with the second indication means when the second indication means is indicated, and the first indication means alone indicates an integer when the second indication means is not indicated.

4,106,034

CAMERA HAVING MULTIZONE SHUTTER MECHANISM

Loring K. Mills, Hampton, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,431
Int. Cl.² G03B *7/08, 9/46*
U.S. Cl. 354—31 **5 Claims**



1. In a camera having a lens for directing and focusing image-carrying rays from photographic scene to film material located at the camera focal plane, a shutter mechanism actuatable for blocking or unblocking the transmission of image-carrying rays to said focal plane, photosensitive means for sensing the brightness of spatially oriented areas of said scene, and selectively operable means for actuating said camera to expose said film material, the improvement wherein said shutter mechanism includes:

a plurality of opaque shutter elements mounted for displacement independently of each other between a closed position wherein each said element is in blocking relation to light from a respective area of said scene and an open position wherein each said element is in unblocking relation to its respective area of said scene to thereby transmit light therefrom to a respective elemental area of said film material;

means for biasing said shutter elements toward their said closed positions;

means responsive to said selectively operable means for substantially simultaneously displacing said shutter elements to their said open positions to initiate an exposure interval, said displacing means including a member mounted around said shutter elements and adapted for circumferential displacement with respect thereto, said member carrying a plurality of cam surfaces, each operatively coupled to a respective one of said shutter elements such that upon displacement of said member each said shutter element is displaced to its said open position; and

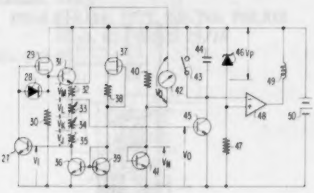
means responsive to said brightness sensing means for retaining each said shutter element in its said open position and for subsequently releasing each said shutter element for displacement to its said closed position after an interval related to the brightness of its respective scene area to provide an exposure interval for each elemental area in relation to its respective scene area.

4,106,035

PHOTOMETRIC CIRCUIT

Masahiro Kawasaki, and Yoshio Sawada, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,587
Claims priority, application Japan, Apr. 25, 1975, 50-50470
Int. Cl.² G03B *7/08*
U.S. Cl. 354—51 **2 Claims**



1. A photometric circuit for electronically determining proper exposure time based on scene brightness, film sensitivity and aperture settings, said circuit being of the type having a photoelectric transducer for developing a current dependent upon scene brightness, a first transistor having its collector connected to said photoelectric transducer and its base connected to its collector by a high input impedance collector-to-base feedback circuit for developing a base-to-emitter voltage related to the apex indication value B_v of the brightness B of the scene, a pair of variable resistors for setting the film speed and aperture values into the circuit, respectively, and a second transistor for developing an exposure control current at its collector in dependance upon the voltage applied between its base and emitter, the improvement comprising:

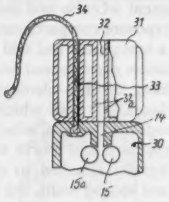
said variable resistors being connected in series with each other and in the feedback circuit between collector and base of the first transistor; constant current source means connected to said series connection of said variable resistors for providing a constant current to said variable resistors having a value which causes the voltages across said resistors to be related to the apex indication values S_v and A_v, respectively; said second transistor having its base-emitter circuit connected in a circuit loop with said variable resistors and said base-emitter circuit of said first transistor, said constant current source means providing a current having a value such that the temperature characteristics of the voltages thereby created across the variable resistors per one step of the exposure determining factors, respectively, substantially satisfy $(KT/q) \log_e 2$, where K is Boltzmann's constant, q is the electric charge of an electron, and T is an absolute temperature; said constant current source means comprising a third transistor having its collector connected to said series connected variable resistors, its emitter connected to a source of reference potential; and means for providing a voltage dependent upon the absolute temperature connected to its base, comprising a diode and a self biased FET connected in series across a power supply, the junction between said FET and said diode being connected to the base of said third transistor.

4,106,036

ACCESSORY UNIT FOR PHOTOGRAPHIC APPARATUS

Richard Wick; Otto Stemme, both of Munich; Peter Lermann, Narring, and Karl-Heinz Schultheiss, Taufkirchen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 17, 1977, Ser. No. 797,795
Claims priority, application Fed. Rep. of Germany, May 20, 1976, 2622604
Int. Cl.[2] G03B *17/50, 15/02*
U.S. Cl. 354—83 19 Claims



1. An accessory unit for use with a photographic apparatus, comprising a housing; means for connecting said housing to a photographic apparatus; and at least one slot-shaped passage in said housing for passage therethrough of a camera strap associated with the photographic apparatus.

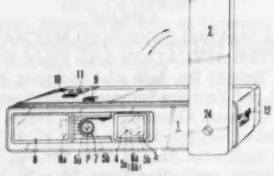
2. An accessory unit for use with a photographic apparatus, comprising a housing; means for connecting said housing to a photographic apparatus; and at least one slot-shaped passage in said housing for passage therethrough of a film sheet which is to be ejected from the photographic apparatus.

4,106,037

FLASH DEVICE FOR USE WITH A CAMERA

Zenzo Nakamura, Urawa, and Goro Hasegawa, Fuchu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,174
Claims priority, application Japan, Dec. 27, 1975, 50/177067
Int. Cl.[2] G03B *15/03, 17/02*
U.S. Cl. 354—128 8 Claims



1. A photographic camera comprising:

(A) a box-shaped light-tight camera housing having a flat frontal surface provided with a first opening for exposing film and a second opening for view finding;

(B) a shutter device disposed behind said first opening within said housing;

(C) a synchronous signal generating means, within said housing for generating a synchronous signal with operation of said shutter device;

(D) connector means within said housing for receiving and electrically connecting an electrical power source;

(E) a first terminal means disposed on a portion of said frontal surface of the housing and electrically connected with said synchronous signal generating means and said connector means;

(F) a box-shaped shielding means for shielding said first and second openings of the frontal surface of the camera housing, said shielding means having a flat rear surface corresponding to said frontal surface of the camera housing and a frontal surface facing an object to be photographed and attached to the camera housing and movable within a plane substantially parallel to the frontal surface of the camera housing between a first and second openings of the frontal surface of the camera housing by said rear surface and a second position at which the shielding means exposes the first and second openings; said frontal surface of the shielding means being provided with a third opening and said rear surface of the shielding means being provided with a fourth opening;

(G) a releasable fixing means for selectively fixing said shielding means against the camera housing at said first and second positions respectively;

(H) a flash device for emitting a flash with the electrical power supplied from said electrical power source and in response to the synchronous signal generated by said synchronous signal generating means, said flash device being disposed within said shielding means and comprising:

(H-1) a flash lamp disposed within the shielding means at a position corresponding to said third opening of the frontal surface so as to emit the flash light to the object through the third opening; and

(H-2) indication means for indicating the state of preparation of the flash device for flash light emission, said indication means being disposed within the shielding means at a position corresponding to said fourth opening of the rear surface so that the indicating of the indication means is observable from the outside of the shielding means;

(I) second terminal means for electrically connecting said flash device with said electrical power source and said synchronous signal generating means, said second terminal means being disposed on a portion of the rear surface of the shielding means at such a position as to be contacted with said first terminal means when the shielding means is set to said second position; and

(J) manually operable switch means for controlling the electrical power supply to the flash device from said electrical power source, said switch means being inserted and connected between said second terminal means and the flash device and operable manually from the outside of the shielding means.

4,106,038

INDICATOR IN A FINDER

Yukimasa Kawakita, and Youichi Okuno, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 482,896, Jun. 25, 1974, abandoned, which is a continuation of Ser. No. 393,185, Aug. 30, 1973, abandoned. This application May 24, 1976, Ser. No. 688,964
Claims priority, application Japan, Sep. 4, 1972, 47/88545
Int. Cl.[2] G03B *19/12*
U.S. Cl. 354—155 11 Claims

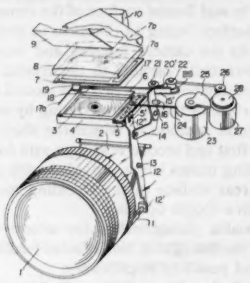
1. A single lens reflex camera having an objective lens, an eyepiece,

a focusing screen on which an image formed by the light transmitted by the objective lens is focused, said screen having first and second faces, said focusing screen having a first zone in which the image is formed and a second zone adjacent thereto, said screen having a plurality of projections on one of the faces in the first zone, a portion protruding beyond the projection from one of the faces of the focusing screen and completely surrounding the first zone and separating the first zone from the second zone;

a movable exposure information indication member positioned in the second zone of the focusing screen, and

a light guide means including a pentaroof prism for guiding the light from the first and second zones of the focusing screen to the eyepiece,

characterized in that said protruding portion is integral with



said one of the faces of the focussing screen and that said protruding portion and said screen is composed of a single unitary continuous homogeneous material, and light transmitting means including a transparent member cover said portion and form a dust tight space over the first zone.

4,106,039

SIDE-FOLDING BELLOWS ELEMENT FOR FOLDING CAMERA

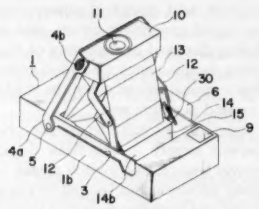
Susumu Fukuda, Kobe, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 10, 1976, Ser. No. 740,460

Claims priority, application Japan, Nov. 10, 1975, 50/135528

Int. Cl.[2] G03B *17/04*

U.S. Cl. 354—193 **3 Claims**



1. In a folding camera comprising a main body of rectangular box-like configuration having a first housing section which is formed with an exposure opening in a forward wall thereof facing a forward side of the main body in terms of the object being photographed so as to accommodate therein a film container in such a manner that an exposure opening of the film container coincides with said exposure opening of said first housing section and a second housing section being formed in a position adjacent to said first housing section and between said forward side and a rear side of said main body, lens supporting means having exposure means incorporated therein, a cover plate member pivotably connected at one end thereof to said main body in a position corresponding to said second housing section with said exposure opening of said first housing section being located therebetween, for rotation between a first position to cover said forward side of said main body and a second position whereat said lens supporting means is held in photographing position, with the other end of said cover plate member pivotably connected to an adjacent corner portion of the sidewall of said lens supporting means for covering, at said first position, said forward side of said main body into which said lens supporting means is housed, a pair of folding link levers, each pair having first and second lever members pivotably connected at their ends to each other for being folded in one direction with one end of the first lever member of each of the pairs being pivotably connected to said main body and one end of the second lever member of each of said pairs being pivotably connected to the corner portion diametrically opposite to said adjacent corner portion of the sidewall of said lens supporting means for pivotably supporting said lens supporting means together with said cover plate member, during rotation thereof between said first and second positions, and a collapsible light-shielding bellows having one peripheral edge secured around said exposure opening of said first housing section, and the other peripheral edge thereof fixed around the rear face of said lens supporting means with said bellows being expanded at said second position and folded into a flat state at said first position, the improvement wherein said main body first housing section forms an exposure compartment, said lens supporting means comprises a lens mount and said main body second housing section constitutes a lens mount housing, said bellows comprises a side folding bellows element made of opaque material and comprising a first wall which is nearest to said lens mount housing, and a second wall which is parallel to said first wall, and identical third and fourth walls which extend between and are integrally attached to opposite side edge portions of said first and second walls, the front edges of said first, second, third, and fourth walls being fixedly attached to the rear surface of said lens mount and together therewith defining an opening through which image-wise light directed towards the interior of said camera by said lens assembly may freely pass, the rear edges of said first, second, third, and fourths walls being fixedly attached to the front surface of said first housing section at said exposure compartment together therewith defining an opening which permits free impingement of said image-wise light on said film material, said first wall having defined therein a forward-end fold-in line portion which is a short distance from and is parallel to the front edge of said wall and extends between opposite side edges of said wall and a generally central rear end fold-in line portion which extends between opposite side edges of said first wall and is parallel to said first forward-end fold-in line portion of said first wall, said second wall defining a forward-end fold-in line portion which is a short distance from and is parallel to the front edge of said second wall and extends between opposite side edges of said second wall, and each of said third and fourth walls defining a first fold-out line portion which extends from a first corner portion thereof which adjoins a rear corner portion of said second wall to a point at which said forward-end fold-in line portion of said first wall meets an edge of said third and fourth walls, and subsidiary fold-in and fold-out line portions in the areas defined between said first fold-out line portion and edge portions of said third and fourth walls.

4,106,040

CAMERA HAVING IMPROVED MECHANISM FOR SHUTTER ACTUATION AND FILM WINDING

Fumio Ito; Tadashi Ito, both of Yokohama; Akio Sunouchi, Kawasaki, and Kanehiro Sorimachi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 558,731, Mar. 17, 1975, abandoned. This application Jun. 28, 1977, Ser. No. 810,969

Claims priority, application Japan, Mar. 20, 1974, 49/31741; Mar. 20, 1974, 49/31742; Apr. 16, 1974, 49/43052

Int. Cl.[2] G03B *17/42, 17/38*

U.S. Cl. 354—205 **6 Claims**

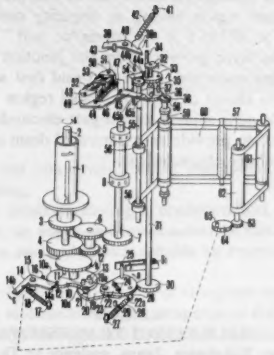
1. A camera of the type having an electromagnetically controllable shutter release mechanism including latching means arranged to hold shutter release means in a shutter-tensioned position, magnet means cooperative with said latching means upon actuation thereof to release it from the latching position to the releasing position, a control circuit for electromagnetically controlling the operation of said magnet means, and film winding and shutter tensioning mechanisms which are operatively connected to each other by a single operating member, said film winding mechanism comprising:

(a) drive means arranged to be rotatable in only one direc-

tion in response to a predetermined motion of the single operating member;

(b) reciprocative rotary means arranged to be turned in a direction for bringing said shutter release means to the latched position, and after completion of the shutter tensioning operation to be turned in the opposite direction to the starting position;

(c) swingable means engaging with said rotary means and arranged to be brought into engagement with said drive means during a rotation of said drive means to a predetermined angular extent for transmitting the motion of the single operating member to said rotary means to effect the setting of said shutter release means to the latched posi-



tion, and after completion of the shutter tensioning operation, to be returned in disengagement with said drive means;

said swingable means being provided with an actuator positioned adjacent a switch of said control circuit so that during the shutter tensioning operation said switch is opened to eliminate the force of said magnet means; and

wherein said drive means and said swingable means are provided with first and second cam arrangements made at the interconnection therebetween and complementary with each other so that as soon as the first cam arrangement is disengaged, the second cam arrangement is established through which the motion of said drive means is transmitted to said swingable means.

4,106,041

FILM-TRANSPORT AND SHUTTER-CONTROL SYSTEM FOR CAMERAS

Karl Heinz Lange, Bünde, Fed. Rep. of Germany, assignor to Balda-Werke Photographische Gerate Und Kunststoff GmbH & Co., KG., Fed. Rep. of Germany

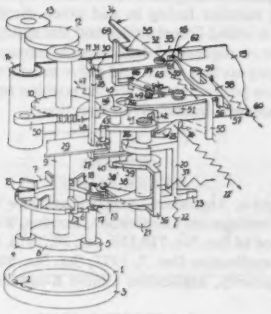
Filed Nov. 9, 1976, Ser. No. 740,268

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553501

Int. Cl.² G03B *17/42*

U.S. Cl. 354—206 **9 Claims**

1. In a camera, shutter-control means and support means supporting said shutter-control means for movement between a pair of end positions one of which is a release end position where said shutter-control means releases a camera shutter and other of which is a cocked end position where a shutter of the camera is cocked and ready to be released, film-transporting means for transporting film, drive means operatively connected with said shutter-control means for driving the latter from said release end position to said cocked end position thereof, said drive means also being operatively connected with said film-transporting means for operating the latter to transport film, and drive-control means operatively connected with said drive means for automatically controlling the latter for first transmitting a drive to said shutter-control means while preventing transmission of a drive to said film-transporting means until said shutter-control means reaches said cocked end position thereof, and for then, during continued unidirectional operation of said drive means, transmitting a drive to



said film-transporting means while said shutter-control means remains in said cocked end position thereof without any further transmission of a drive thereto.

4,106,042

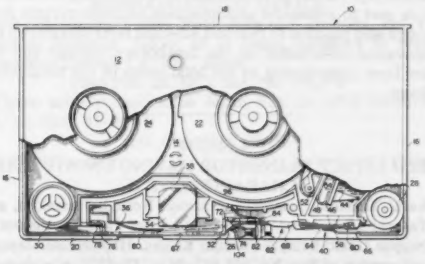
MULTIPURPOSE FILM CASSETTE HAVING A PROCESSOR DISABLING VALVE RETENTION ARRANGEMENT

Frank M. Czumak, Derry, N.H., and Joseph A. Stella, Peabody, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 26, 1977, Ser. No. 791,034

Int. Cl.² G03D *5/00*

U.S. Cl. 354—317 **6 Claims**



1. A photographic film handling cassette for use with other apparatus for treating a strip of exposed photographic film material with processing fluid to develop viewable images on the film strip, said cassette comprising:

a housing for retaining the film strip;

means responsive to drive means of said other apparatus for advancing the film in a given path within said housing;

film processing means for depositing a layer of processing fluid on the exposed film strip, said processing means including a nozzle opening configured for releasing processing fluid to the film strip;

selectively operable means for disabling said film processing means following deposit of said fluid layer, said disabling means comprising a valve member slidably mounted within said cassette for movement, responsive to film advancement in a given direction, in said given direction from a first position adjacent said nozzle opening to a second position wherein said valve member is in blocking engagement with said nozzle opening, said valve member further comprising a leaf spring member forming a part thereof and extending from said valve member in a direc-

tion opposite and angularly oriented from said given direction of advancement of said film strip; and

cassette structure presenting an engaging surface facing in a direction substantially opposite to said given direction and configured to cooperate with at least a portion of said leaf spring member facing in said given direction when said valve is in said first position, said leaf spring member being further configured to deflect out of engagement with said engaging surface when said valve member is moved from said first position to said second position responsive to film advancement in said given direction.

4,106,043

ZENER DIODES

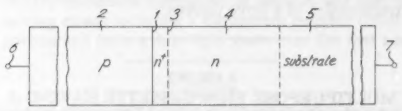
Brian Culshaw, Amersham, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 710,156, Jul. 30, 1976, abandoned. This application Dec. 7, 1977, Ser. No. 858,405

Claims priority, application United Kingdom, Jul. 31, 1975, 3207/75

Int. Cl.[2] H01L *29/90*

U.S. Cl. 357—13 **5 Claims**



1. A zener diode comprising a pn junction having two successive n-type layers on one side of the junction which two layers are differently doped to each other, the layer adjacent the junction being of such thickness and of higher concentration than the other n-type layer so that breakdown in said adjacent layer is due at least in part to a tunnelling mechanism and in part to avalanche multiplication to cause current flow through said junction so that said adjacent layer determines the temperature co-efficient of the breakdown voltage and the other layer contributing to the total value of the breakdown voltage.

4,106,044

FIELD EFFECT TRANSISTOR HAVING UNSATURATED CHARACTERISTICS

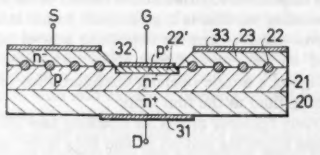
Takashi Yoshida, Hamamatsu; Masao Kosugi, Hamakita, and Takeshi Matsuyama, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 558,697, Mar. 17, 1975, abandoned. This application May 27, 1977, Ser. No. 801,248

Claims priority, application Japan, Mar. 16, 1974, 49-29616; Apr. 6, 1974, 49-38473

Int. Cl.[2] H01L *29/78*

U.S. Cl. 357—22 **12 Claims**



1. A field effect transistor comprising:

a source electrode, a gate electrode and a drain electrode,

a first semiconductor region of a first conductivity type connecting said source and drain electrodes, and

at least two gate semiconductor regions of a second conductivity type relatively disposed in said first semiconductor region such that a common plane passes centrally through said gate region with said gate regions extending outwardly on either side of said plane a predetermined distance, adjacent boundaries of said gates being separated in said plane by a distance ranging from 15 to 2.0μm,

said gate regions defining a channel region within said first semiconductor region,

said channel region being those portions of said first semiconductor region located between adjacent ones of said gate regions and extending outwardly on either side of said plane said predetermined distance, the width of said channel region being defined by the separation in said plane of said adjacent gate region boundaries and the length of said channel region being defined by said predetermined distance on either side of said plane,

said channel region having an impurity concentration of from 1×10^{13} to 1×10^{15} atoms/cc, and

a depletion layer growing from the junction between said gate semiconductor region and said first semiconductor region to almost close said channel region when no gate bias voltage is applied to said gate electrode to cause the transistor to provide an unsaturated drain current versus drain voltage characteristic.

4,106,045

FIELD EFFECT TRANSISTORS

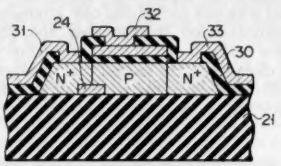
Yoshio Nishi, Yokohama, Japan, assignor to The President of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed May 14, 1976, Ser. No. 686,537

Claims priority, application Japan, May 20, 1975, 50-59298

Int. Cl.[2] H01L *29/78*

U.S. Cl. 357—23 **5 Claims**



1. A field effect transistor comprising:

an insulating substrate,

a semiconductor layer having a prescribed height, formed on said substrate,

source, gate and drain regions formed in said semiconductor layer in the height direction of said semiconductor layer entirely over said prescribed height thereof,

said source and drain regions each having a high impurity concentration of one conductivity type and said gate region having an impurity concentration of the other conductivity type, said source and drain regions forming a junction with said gate region which is situated between said source and drain regions,

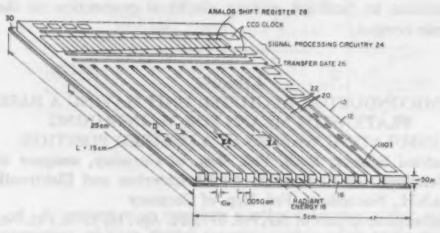
a gate electrode provided on said gate region for inducing a channel in said gate region, and

a buried layer formed in the gate region mounted on the insulating substrate and abutting on the junction between said source and gate regions, and having the same conductivity type as that of said gate region and a higher impurity concentration than said gate region, said buried layer being out of contact with said drain region and having a height not more than half the height of said source and drain regions.

4,106,046
RADIANT ENERGY SENSOR

Harvey C. Nathanson, Pittsburgh, and Michael M. Sopira, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 26, 1977, Ser. No. 762,544
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 13 Claims



1. A sensor for converting radiant energy into electrical signals comprising:

a crystalline substrate having a predetermined crystalline orientation, an upper and lower substrate surface and an end surface, said end surface suitable for receiving radiant energy;

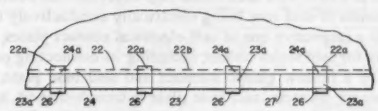
said substrate including a plurality of elongated detectors for generating electronic charge in response to the passing of radiant energy through said end surface and said detector; and

one of said elongated detectors including conductive electrodes on said upper and lower substrate surface for placing a voltage potential between said upper and lower surface and having portions thereof physically separated from adjacent detectors by grooves in said substrate, said grooves extending from the upper surface towards the lower surface and having side walls bounded by selected crystalline planes of said substrate for electrically and optically isolating said detector and adjacent detectors.

4,106,047
SOLAR CELL WITH DISCONTINUOUS JUNCTION

Joseph Lindmayer, 1335 Piccard Dr., Rockville, Md. 20850

Filed Mar. 28, 1977, Ser. No. 775,961
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 6 Claims

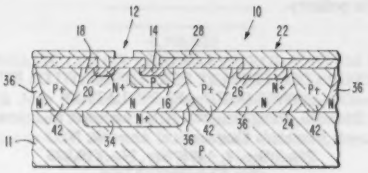


1. A solar energy cell capable of maintaining a substantially constant voltage, comprising a wafer having opposed front and back surfaces, said front surface being adapted to absorb light impinging thereon, rectifying junction formed in said wafer at said front surface and another electrical junction formed in said wafer at said back surface, said back junction being discontinuous and thereby forming portions thereof enhancing and opposing the action of the front junction, said enhancing portions in their entirety comprising substantially less than the area of said wafer at said back junction, said enhancing portions forming a step junction with said wafer.

4,106,048
INTEGRATED CIRCUIT PROTECTION DEVICE COMPRISING DIODE HAVING LARGE CONTACT AREA IN SHUNT WITH PROTECTED BIPOLAR TRANSISTOR

Heshmat Khajezadeh, Somerville, N.J., assignor to RCA Corp., New York, N.Y.

Filed Apr. 27, 1977, Ser. No. 791,424
Int. Cl.[2] H01L *27/02*
U.S. Cl. 357—40 9 Claims



1. An integrated circuit protection device for a transistor having a collector region, a base region, and an emitter region, said emitter region forming with said base region a PN junction comprising:

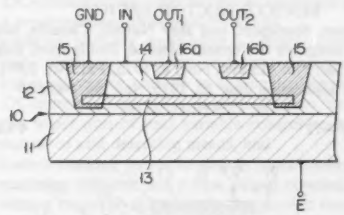
(a) a diode having one electrode connected to a first area on a first region of said diode, said electrode also being connected to a second area on said emitter, said first region having the same conductivity type as said emitter;

(b) a second region of the diode having opposite conductivity type to said first region, a PN junction formed between said first region and said second region of said diode, and means for making electrical contact to said second region, said first area being much larger than said second area.

4,106,049
SEMICONDUCTOR DEVICE

Satoshi Shinozaki; Yoshio Nishi, both of Yokohama, and Yoshihisa Mizutani, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Feb. 22, 1977, Ser. No. 770,270
Claims priority, application Japan, Feb. 23, 1976, 51-18713; Feb. 23, 1976, 51-18714
Int. Cl.[2] H01L *27/02*
U.S. Cl. 357—46 12 Claims



1. A semiconductor device comprising:

a D.C. voltage supply region comprising a semiconductor substrate of one conductivity type having at least a surface layer of high impurity concentration,

a first layer of the same conductivity type as that of the voltage supply region provided on said surface layer and having an impurity concentration lower than that of the surface layer,

a thin second layer of the opposite conductivity type to said one conductivity formed completely in the first layer and having an impurity concentration intermediate that of said substrate and said first layer,

a grounding region of said opposite conductivity type formed in the first layer and surrounding a specified region thereof, which extends from the outside surface of

the first layer to the second layer and provides a signal input region as defined by the surrounded specified region, and

at least one signal output region provided in the surface of the signal input region at a position spaced apart from the grounding region and constituting a diode therewith,

wherein the surface layer, the second layer and the signal input region constitute a vertical transistor of one polarity, and the second layer, the signal input region and the signal output region constitute a vertical transistor of the opposite polarity.

4,106,050

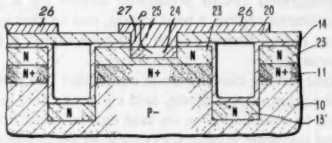
INTEGRATED CIRCUIT STRUCTURE WITH FULLY ENCLOSED AIR ISOLATION

Jacob Riseman, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 2, 1976, Ser. No. 719,888

Int. Cl.[2] H01L *27/04*

U.S. Cl. 357—49 **5 Claims**



1. An integrated circuit member structure comprising:

a semiconductor substrate having formed therein a pattern of cavities extending from one surface of said substrate into the substrate,

a plurality of pockets of semiconductor material extending from said surface laterally surrounded and electrically insulated by said cavities,

a planar layer of electrically insulative material over said surface,

said cavities being fully enclosed by the combination of said substrate and said planar layer, and

a metallization pattern formed on said layer of insulative material and selectively connected to a plurality of said pockets.

4,106,051

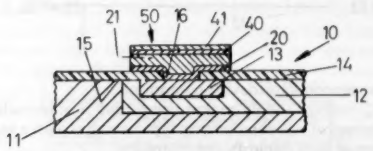
SEMICONDUCTOR DEVICES

Leslie Dormer, Stockport, and Roy Nuttall, Cheadle, both of England, assignors to Ferranti Limited, Hollinwood, England

Division of Ser. No. 413,894, Nov. 8, 1973, Pat. No. 3,881,242. This application Jan. 22, 1975, Ser. No. 543,181

Int. Cl.[2] H01L *23/48*

U.S. Cl. 357—71 **4 Claims**



1. A semiconductor device comprising a passivating layer of silicon oxide on at least one surface of a monocrystalline silicon semiconductor body and an ohmic contact extending both to a part of said surface of the semiconductor body exposed through an aperture in the passivating layer and on portions of the passivating layer adjacent to the aperture, including a first polycrystalline silicon layer on the passivating layer and extending within the aperture in the passivating layer, a layer of a metal selected from the group consisting of tungsten and molybdenum on the first polycrystalline layer, and a second polycrystalline silicon layer on the metal layer, at least one of the polycrystalline layers including a finite resistance, the thickness of said at least one layer being in the range 200 A to 500 A such that the resistance is obtained by an impurity concentration in the layer to provide for the satisfactory operation of the semiconductor device, and the ohmic contact further including on said second polycrystalline silicon layer a further metal layer selected from the group consisting of gold and aluminum to facilitate making electrical connection to the ohmic contact.

4,106,052

SEMICONDUCTOR RECTIFIER UNIT HAVING A BASE PLATE WITH MEANS FOR MAINTAINING INSULATING WAFERS IN A DESIRED POSITION

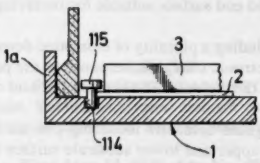
Winfried Schierz, Roth, Fed. Rep. of Germany, assignor to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H., Nuremberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 677,851, Apr. 16, 1976, Pat. No. 4,047,197. This application Sep. 1, 1977, Ser. No. 829,911

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1975, 7512573

Int. Cl.[2] H01L *23/28, 23/02, 23/12*

U.S. Cl. 357—72 **14 Claims**



1. In a semiconductor rectifier unit comprising: a metal base plate; a pair of spaced electrical contact plates each fastened to a surface of said base plate via a wafer of electrically insulating, thermally conductive material; a pair of semiconductor rectifier devices, each having at least one pn junction and a connecting contact on each of its two opposite major surfaces, each of said semiconductor devices being mounted on and having one of its said connecting contacts electrically connected to a respective one of said electrical contact plates; conductive means for electrically connecting one connecting contact of one of said semiconductor rectifier devices to one connecting contact of the other of said semiconductor rectifier devices to connect said semiconductor devices in a series circuit; first, second and third current conducting terminals connected to the input of said series circuit, to the output of said series circuit, and to said conductive means, respectively, said first, second and third current conducting terminals being arranged in a row with each of the two outer current conducting terminals of said row being electrically conductively connected to a respective one of said electrical contact plates; and a housing for said series circuit, including its connecting parts, formed by a hollow plastic member and said base plate; the improvement wherein: said base plate is trough-shaped, has a planar outer bottom surface, has a laterally extending flange on the side walls thereof, and is formed of a material which permits a permanently firm connection with components made of copper used to produce said series circuit as well as with components made of aluminum used to cool the unit;

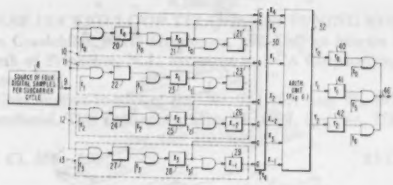
means are provided on the bottom inner surface of said base plate, on which said series circuit is mounted, for maintaining said wafer of insulating material in a desired position on said base plate during production of said unit; and

the edge portion of said plastic housing member which is adjacent said base plate is provided with a shaped region which matingly engages said flange to firmly connect said plastic housing member to said base plate.

4,106,053
DIGITAL SAMPLING RATE CONVERSION OF COLOR TV SIGNAL

Nicholas Frank Maxemchuk, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,933
Int. Cl.[2] H04N *9/32*
U.S. Cl. 358—13 **5 Claims**



1. A converter to translate a color television video signal consisting of four digital samples during each cycle of the color subcarrier to a corresponding signal consisting of three digital samples during each cycle of the color subcarrier, comprising

a plurality of input registers connected to receive a respective plurality of successive digital samples,

three output registers for three output digital samples per cycle of the color subcarrier,

means to couple the contents of one of said input registers to one of said three output registers,

means to weight and combine the contents of predetermined ones of said input registers and couple the result to a second one of said three output registers,

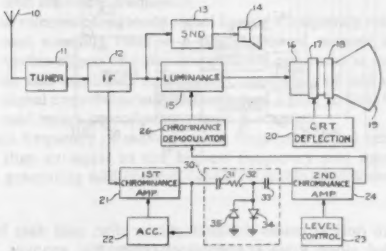
means to weight and combine the contents of predetermined ones of said input register and couple the result to a third one of said three output registers, and

means to couple the contents of said three output registers in sequence at the cycle rate to an output channel.

4,106,054
AUTOMATIC CHROMA LEVEL SYSTEM

George J. Tzakis, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 19, 1977, Ser. No. 760,777
Int. Cl.[2] H04N *9/535*
U.S. Cl. 358—27 **8 Claims**



1. In a color television receiver having a luminance channel for processing luminance information; a chrominance channel for processing an amplitude and phase modulated chrominance signal; and display means, including a viewing screen, for forming a picture image the color saturation of which for any given luminance level is determined by the amplitude of said chrominance signal; the improvement comprising:

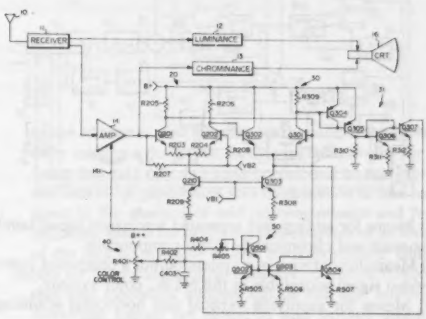
amplitude limiting means within said chrominance channel, operative upon said chrominance signal and having a non-linear gain characteristic which decreases with increased chrominance signal amplitude and producing progressively smaller increases in color saturation of said image in response to corresponding chrominance signal amplitude increases, said amplitude limiting means including:

threshold means having a pair of semiconductor junctions attenuating opposite sense excursions of said chrominance signals to provide symmetrical limiting thereof and causing said amplitude limiting means to exhibit said non-linear gain characteristic solely for chrominance signals having amplitudes in excess of a predetermined threshold level.

4,106,055
AUTOMATIC COLOR LEVEL CONTROL SYSTEM WITH THRESHOLD TRACKING

Kenneth John Burdick, Wyoming; Douglas William Constable, Batavia, and Robert Charles Wheeler, Elba, all of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jul. 5, 1977, Ser. No. 813,086
Int. Cl.[2] H04N *9/537*
U.S. Cl. 358—27 **14 Claims**



1. In a color television receiver, an automatic color level control system comprising:

a DC-controlled amplifier having chrominance information for an input and an output coupled to the receiver's chrominance channel, said amplifier having a gain determined by the control voltage present at a control terminal;

a detecting means responsive to the output signals of said DC-controlled amplifier having an amplitude greater than a predetermined threshold level; and

a summing network comprising a variable control resistor and a discharge capacitor, said summing network providing said control voltage to the control terminal of said DC-controlled amplifier in proportion to the voltage on the wiper arm of said variable control resistor and the output of said detecting means, and

a control tracking means having an input connected to said summing network and a first output coupled to said detecting means so that said pre-determined threshold level varies in accordance with said control voltage.

4,106,056
SOLID STATE CCD CAMERAS HAVING PHASE ADJUSTMENT OF LUMINANCE AND CHROMINANCE COMPONENTS

Fumio Nagumo, Yokohama, and Seisuke Yamanaka, Mitaka, both of Japan, assignors to Sony Corporation, Japan

Filed May 24, 1977, Ser. No. 800,013
Claims priority, application Japan, May 28, 1976, 51-62081
Int. Cl.[2] H04N *9/09, 9/07*
U.S. Cl. 358—50 **10 Claims**

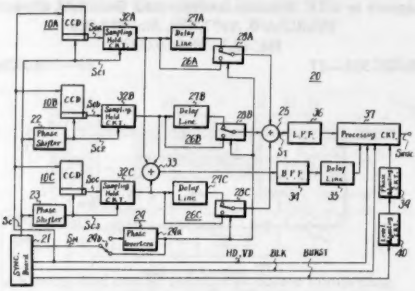
1. A solid state color camera of a type in which a composite color video signal of the NTSC System is obtained without using a specific color encoder, comprising:

(A) Solid state image sensing means having a plurality of image sensing cells aligned in both vertical and horizontal directions for converting a light information of an object into an electric signal information in association with said image sensing cells;

(B) Color filter means disposed in a light path of said light information of the object for modifying said electric signal information in accordance with color components included in said light information;

(C) Read out register means adapted to receive said electric signal information of one horizontal scanning period line by line from said solid state image sensing means and to supply an output video signal in a serial form;

(D) Means for separating a luminance signal component and chrominance signal component out of said output video signal from said read-out register means;



(E) Means for adding said separated luminance signal components and chrominance signal components;

(F) Means for deriving at a system output a composite color video signal acceptable in the NTSC color system;

(G) Means for supplying vertical and horizontal scanning signals to said solid state image sensing means;

(H) Means for supplying read-out pulses to said read-out register means, a frequency of said read out pulses being selected to $M/N \times f_S$, where N and M are both integers and f_S is a frequency of subcarrier of the NTSC color system; and

(I) Means for adjusting phase conditions of said luminance signal components at said system output so that they become equal to said alignment states of said image sensing cells of said solid state image sensing means.

4,106,057

DUST PROOF OPTICAL SYSTEM FOR OPTICALLY READING AND WRITING ON A ROTATING RECORD WITH THE AID OF A RADIATION BEAM

Petrus Adrianus Wilhelmus Van Vroenhoven, Indhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,310

Claims priority, application Netherlands, May 20, 1976, 7605374

Int. Cl.[2] H04N *5/76*; G11B *7/12*

U.S. Cl. 358—128 **3 Claims**

1. An improved apparatus for optically reading a rotating record with the aid of a radiaton beam, comprising:

a housing,

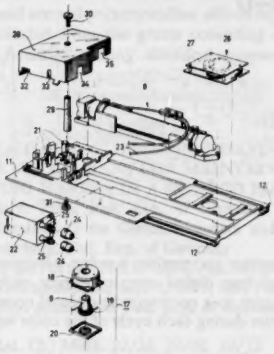
a rotating record spindle,

a radiation source for producing at an end thereof the radiation beam,

a number of optical elements which include a movable objective which with a part which faces the outside of the housing is movably mounted in a slot in a wall of the housing and which serves for focussing the radiation beam at a record to be read,

a number of electrical means which co-operate with the optical means, including at least one radiation-sensitive electronic component for converting a radiation beam modulation into an electrical modulation, and at least one control coil for controlling controllably movable optical elements such as the objective, and

a carriage which is movable inside the housing, transversely to the rotatable record spindle, on which carriage the said optical and electronic elements are mounted, the improvement wherein a part of the objective facing the interior of the housing and all other of said optical elements are jointly accommodated in an enclosure which is secured to the carriage and which provides protection against dust which is present in the interior of the housing, and wherein the end of the radiation source from which the radiation is emitted is sealed within the enclosure.



4,106,058

DATA DISC OPTICAL READER CONTAINING A DEVICE FOR AUTOMATIC DATA ACCESS

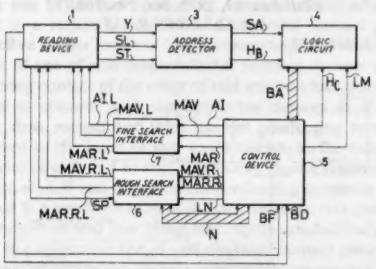
René Romeas, and Michel Thomas, both of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Apr. 19, 1977, Ser. No. 788,923

Claims priority, application France, Apr. 23, 1976, 76 12067

Int. Cl.[2] G11B *7/12*; H04N *5/76*; G11B *19/14, 21/08*

U.S. Cl. 358—128 **21 Claims**



1. An optical reader for data carrier disc, said data being recorded along a track formed of concentric grooves, said track containing a succession of alternate elements optically detectable, adresses for said grooves formed by coded numbers being recorded at the same time as said data on each corresponding groove, said optical reader comprising a radiating source, a reading head intended to receive the radiation and to focus it on said track, a rotating device causing said disc to rotate, a detecting device for detecting the radiation coming from said track and supplying an electrical signal, a demodulation device, for demodulation said electrical signal, having an output delivering a demodulated signal and a device for automatic access to the data recorded on said disc, said automatic access device comprising an address detection device intended

to supply a detected address formed by a coded number, a rough search device to position said reading head from an initial groove to a predetermined distance from the track groove required, said required groove being identified by the recording of its address a_x in a memory logic circuit, and a fine search device intended to make the said recorded address a_x and the detected coincide.

4,106,059

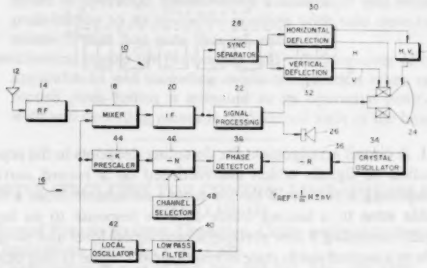
PHASE LOCKED LOOP TELEVISION TUNING SYSTEM

John Goodchilde Norie Henderson, and Charles Martin Wine, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 718,455, Aug. 30, 1976, abandoned. This application Mar. 18, 1977, Ser. No. 779,126

Int. Cl.[2] H04N *5/44*

U.S. Cl. 358—191 **12 Claims**



1. A tuning system for a television receiver including an image reproducing means and means for scanning said image reproducing means along lines in a predetermined direction at a first rate H, a predetermined number L of said lines being scanned to form a field, two sequential fields being scanned at a second rate V/2, comprising:

controlled oscillator means for generating a local oscillator signal for tuning said television receiver to a selected channel in response to the amplitude of a control signal;

means for generating a reference frequency signal; and

means coupled to said reference frequency generating means and coupled to said controlled oscillator means for generating said control signal, said control signal representing the phase and frequency relationship between said local oscillator signal and said reference frequency signal, said control signal having amplitude components occurring at said reference frequency;

said reference frequency signal having a frequency related to said scanning rates in a predetermined manner so that visible effects of video components generated in response to said amplitude modulated components of said control signal are substantially cancelled on a field to field basis as said image reproducing means is scanned;

said frequency of said reference frequency signal being less than or equal to the highest frequency said means for generating said control signal is capable of processing.

4,106,060

ELECTRONIC MAIL BOX

Herbert Hill Chapman, Jr., Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 15, 1975, Ser. No. 641,137

Int. Cl.[2] H04B *1/50*

U.S. Cl. 358—256 **6 Claims**

1. Apparatus for electronically mailing a document comprising in combination:

means for receiving said document containing information in printed form to be transmitted to a remote point;

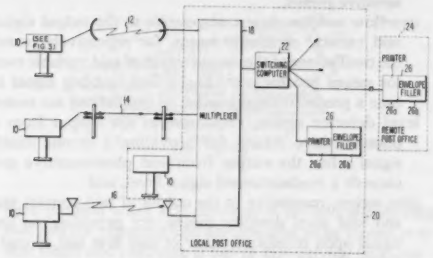
means for reading said information and converting it to electronic signals;

keyboard means permitting entry by an operator of the address to which said information is to be transmitted, said address being manifested as electronic address signals;

storage means receptive of said information electronic signals and said electronic address signals for storing the same;

means coupled to said storage means and responsive to said signals stored therein for transmitting to said remote point, determined by said electronic address signals corresponding to an address entered into said keyboard, said electronic address signals and said information electronic signals;

wherein said address includes postal zip code, city and state



of the addressee, and wherein said apparatus for electronically mailing a document further includes means for verifying that said city and state correspond to said zip code and means for prohibiting said transmission to said remote point in the absence of said correspondence and further including means for notifying said operator of at least one of the lack or presence of said correspondence; and

means for producing a signal indicative of the determination that said electronic address signals and said information electronic signals are stored in said storage means and wherein said transmitting means includes means for permitting said transmission only when said determination indicating signal has been produced.

4,106,061

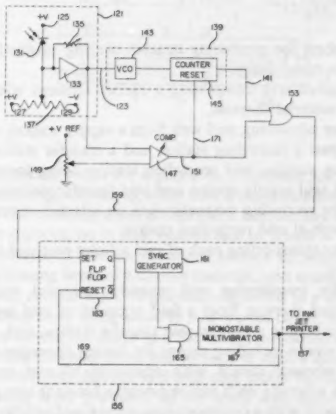
DENSITY CONTROL FOR INK JET COPIER

James E. Burnett, Xenia, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 3, 1977, Ser. No. 774,154

Int. Cl.[2] H04N *1/22, 1/40*

U.S. Cl. 358—296 **11 Claims**



1. An optical encoding device for measuring the tone of a

master along a scan line and for producing an image signal pulse train, the frequency of the pulses in the pulse train being directly related to the tone of the master along the scan line, comprising:

photosensitive means providing a signal level at its output which is dependent upon the light which strikes it,

means for illuminating the master,

optical means for scanning the master along the scan line and directing light reflected from successive portions along the scan line to said photosensitive means,

variable oscillator means, responsive to the output of said photosensitive means, for providing an output signal of a frequency which is dependent on the output of said photosensitive means,

overflow counter means, responsive to the output signal of said variable oscillator means, for repetitively counting the oscillations of the output signal of said variable oscillator means and for providing a first enabling signal each time a predetermined number of oscillations are counted,

level detector means, responsive to the output from said photosensitive means, for providing a second enabling signal when the output from said photosensitive means exceeds a predetermined signal level, and

gate means, responsive to the output of said counter means and said level detector means, for providing an image signal upon receipt of either of said first and second enabling signals.

4,106,062

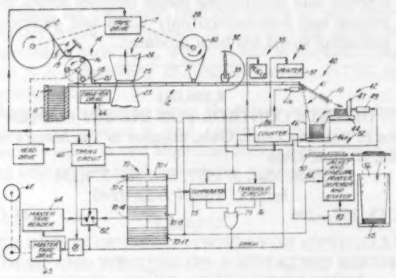
APPARATUS FOR PRODUCING MAGNETICALLY ENCODED ARTICLES

Francis C. Foote, Huntsburg, Ohio, assignor to Addressograph Multigraph Corp., Cleveland, Ohio

Filed May 12, 1976, Ser. No. 685,923

Int. Cl.[2] G11B *5/86, 25/04, 15/20*

U.S. Cl. 360—15 **13 Claims**



1. A system for producing articles bearing magnetic data, said system comprising:

an elongated web comprising a carrier element with magnetic material thereon,

means for advancing said web from a supply station, along a path past a recording station and a transfer station, to a take-up station, said recording station being located between said supply station and said transfer station.

means for recording magnetic data on selected segments of said web at said recording station,

means for transporting each of said articles past said transfer station,

means for transferring said magnetic material with data recorded thereon from a said segment of said web to a corresponding article at said transfer station, and

control means including means for timing operation of said web advance means with operation of said transport means whereby each said segment is brought into general alignment with a corresponding one of said articles at said transfer station to allow transfer of said magnetic material thereto.

4,106,063

CIRCUIT ARRANGEMENT FOR A DROPOUT DETECTOR

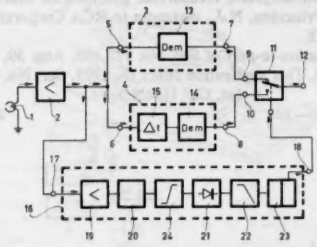
Robert Lackner; Harald Melwisch, and Helfried Kurzmann, all of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,250

Claims priority, application Austria, Jul. 10, 1975, 5346/75

Int. Cl.[2] H04N *5/78*

U.S. Cl. 360—38 **6 Claims**



1. A circuit arrangement for detecting dropouts in the reproduction of signals which are recorded on a record carrier, comprising a threshold device means switchable from a first stable state to a second stable state in response to an input signal exceeding a first predetermined signal level and switchable to a second stable state in response to a signal falling below a second predetermined signal level for providing a different output signal in each of said stable states, and an amplitude discriminator means connected to an input of said threshold device means and receiving said reproduced recorded signals for amplifying said reproduced recorded signals in a signal range between said first and second predetermined signal levels to a much greater extent that said reproduced recorded signals outside said signal range.

4,106,064

CASSETTE-TYPE RECORDING AND/OR REPRODUCING APPARATUS WITH INADVERTENT ERASE PREVENTING DEVICE

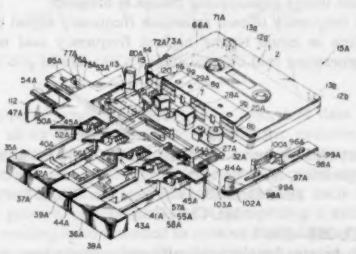
Mutsuo Hoshido, Kashiwa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 27, 1976, Ser. No. 754,169

Claims priority, application Japan, Dec. 25, 1975, 50-174372[U]

Int. Cl.[2] G11B *15/04, 21/20*

U.S. Cl. 360—60 **22 Claims**



1. An apparatus for recording and/or reproducing signals on a magnetic tape contained in a tape cassette having at least one aperture which is alternatively obstructed or unobstructed to respectively indicate that signals may be recorded on the tape contained on such cassette or that the contained tape already

has signals recorded thereon which are not to be erased: said apparatus comprising

cassette holding means for supporting a tape cassette in an operative position;

mechanical detecting means engageable with a tape cassette in said operative position at said aperture of the cassette and having first and second states in dependence on whether the aperture is obstructed or unobstructed, respectively;

a record push-button actuable from a rest position to an operative position to mechanically establish the recording mode of said apparatus, said record push-button being actuable to said operative position thereof with said mechanical detecting means in each of said first and second states thereof;

mechanical change-over means mechanically associated with said record push-button and said mechanical detecting means for changing-over said apparatus to a recording mode of operation thereof upon actuation of said record push-button to its operative position with said detecting means in said first state thereof; and

mechanical means for preventing said changing-over of the apparatus to said recording mode of operation when said record push-button is actuated to its operative position with said detecting means in said second state of the latter.

4,106,065

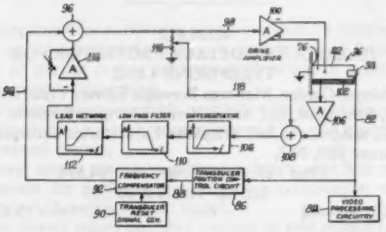
DRIVE CIRCUITRY FOR CONTROLLING MOVABLE VIDEO HEAD

Raymond Francis Ravizza, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 668,581, Mar. 19, 1976, abandoned. This application Apr. 16, 1976, Ser. No. 677,828

Int. Cl.[2] G11B *5/52, 21/10, 21/18*

U.S. Cl. 360—109 **17 Claims**



1. A piezoelectric bimorph and driver therefor, comprising:

a bimorph having a pair of electrically poled piezo-ceramic elements bonded to a common substrate between said elements and aligned in a common poling direction, the bonded pair of elements having a cantilevered end portion and an opposite end portion which is free to deflect; and,

means for applying to each piezo-ceramic element a deflection voltage having a polarity which is in the poling direction of the piezo-ceramic element to which it is applied, whereby a large degree of deflection of the bimorph in either direction can be effected without depolarizing either piezo-ceramic element.

4,106,066

MAGNETIC DISC CARTRIDGE

Ryosuke Kudo, Yokohama, Japan, assignor to Fujitsu Limited, Japan

Filed Dec. 15, 1976, Ser. No. 750,821

Claims priority, application Japan, Dec. 22, 1975, 50-151916

Int. Cl.[2] G11B *23/02*

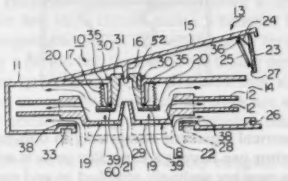
U.S. Cl. 360—133 **11 Claims**

1. A magnetic disc cartridge of the type having

a support disc which carries at least one magnetic disc on its circumference, has a center mortise which fits with a rotatable spindle of a magnetic disc driving unit, and has a hub containing at least one hole through which circulating clean air can flow;

a magnetic disc housing case having an opening in its side wall through which at least a magnetic head enters;

a closure mechanism comprising a top member which is resiliently secured to said case at one end of the member and has a closure member at the other end thereof for covering said opening of said case, said closure member including means cooperating with said magnetic disc drive unit for lifting said top member from a closed to an



open position when said cartridge is set into said driving unit and for restoring said top member to its closed position when said cartridge is out of said driving unit; and

a holding mechanism which holds said support disc down on a base member of said housing case when said closure mechanism closes, wherein the improvement comprises:

a cover for said at least one hole in said hub; and

means operationally connected to said top member of said closure mechanism for lifting said cover to open said at least one hole when said cartridge is set into said driving unit and depressing said cover to close said at least one hole when said cartridge is out of said driving unit.

4,106,067

MAGNETIC HEAD CLEANING JACKET

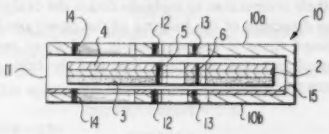
Kenichi Masuyama; Tsutomu Sugisaki; Tatsuji Kitamoto, and Yasuyuki Yamada, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 17, 1976, Ser. No. 724,430

Claims priority, application Japan, Sep. 19, 1975, 50-128741[U]

Int. Cl.[2] G11B *5/00, 5/10, 23/02*

U.S. Cl. 360—137 **5 Claims**

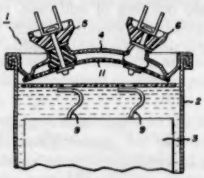


1. A cleaning jacket for a magnetic head used for a flexible disc comprising a cleaning sheet and a sheet retaining jacket, wherein the cleaning sheet comprises a flexible and non-magnetizable support, on at least one surface of which is provided an antistatic layer and on the other surface of which is provided a cleaning layer of a fibrous material, said antistatic layer comprising carbon black or graphite dispersed in a binder and said cleaning layer being made of non-woven fabric, the retaining jacket having the shape of a flat casing and defining a space in which the cleaning sheet can be kept in such a manner that it can rotate freely therein, said retaining jacket further having a lubricating layer provided on the inner wall thereof facing the antistatic layer of the cleaning sheet, said lubricating layer being made of non-woven fabric in which silicone oil or silicone resin is impregnated.

4,106,068
PRESSURE SENSITIVE INTERRUPTER

Robert J. Flanagan, Hudson Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.

Filed Jan. 27, 1977, Ser. No. 763,091
Int. Cl.[2] H02H *7/16*
U.S. Cl. 361—15 5 Claims



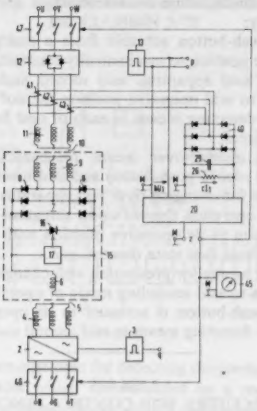
1. An electrical capacitor comprising in combination,
a. a capacitor can having a capacitor section sealed therein,
b. a cover member sealingly attached to said can to seal said capacitor section therein in liquid tight relationship,
c. a pair of terminal means in said cover and extending there through, said terminal means being spaced equidistantly on opposite sides of the center of said cover,
d. an electrical tab member for each of said terminals for connection of said tabs to said capacitor section,
e. a predeterminedly flexible insulating strip bridge member adjacent the underside of said cover,
f. a pair of fulcrum members adjacent the outer extremity of said cover member and restraining said bridge member from upward movement,
g. said bridge member extending across said fulcrum members and having a pair of apertures therethrough in alignment with the terminal means,
h. a stud member in said terminal members extending through said apertures,
i. a pair of tab members electrically connected to said capacitor section and extending up to said bridge member at said apertures,
j. each said tab being formed to prevent axial movement thereof through its said aperture,
k. a welded electrical shear connection joining said tab members to said stud members below said bridge member,
l. said bridge member being characterised by having significant transverse flexibility between said fulcrums so that when said cover member bulges due to increased pressure in said casing, the resulting movement of said terminals and their connection to said tabs flexes the bridge member in the direction of the bulging of the cover until a predetermined stress is encountered in said shear connections and such connections are broken and the bridge member returns to its unflexed condition.

4,106,069
PROTECTION ARRANGEMENT FOR A BRUSHLESS SYNCHRONOUS MACHINE

Jürgen Trautner, Erlangen, and Peter Kolbe, Nüremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 11, 1977, Ser. No. 795,875
Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622309
Int. Cl.[2] H02H *7/08*
U.S. Cl. 361—30 12 Claims

1. In a protection arrangement for protecting a brushless synchronous machine against overvoltages at a field winding which is connected to a rotating excitation rectifier fed from an exciter machine which includes a solid state switching element for short circuiting the field winding if overvoltages occur, the improvement comprising:
a. means for forming a first input voltage proportional, by a first proportionality constant, to the primary voltage of the exciter machine;
b. means for forming a second input voltage proportional, by a second proportionality constant, to the primary current of the exciter machine, the two proportionality constants being chosen so that the absolute value of the second input

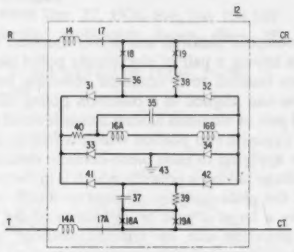


voltage in normal operation of the synchronous machine is lower and, if the field winding is short circuited, is higher than the first input voltage; and
c. voltage comparison means having said first and second voltages as input and providing at its output an indicating signal.

4,106,070
HAZARDOUS VOLTAGE PROTECTOR FOR TELEPHONE LINE

Alan Mayer Gordon, Matawan Borough; Edward Francis Mazurek, Spotswood, and Arden Bernard Wright, Freehold, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 1, 1977, Ser. No. 764,594
Int. Cl.[2] H02H *3/28*
U.S. Cl. 361—42 5 Claims



1. A high voltage protector circuit for providing an interface between terminal equipment having tip and ring leads and a telephone line including tip and ring conductors connected to a central office, the circuit comprising:
tip and ring paths for connecting the tip and ring leads of the terminal equipment to the tip and ring conductors of the telephone line;
means for detecting a current imbalance in the tip and ring paths; and
means responsive to the detecting means for disconnecting the terminal equipment from the telephone line and for

restoring the connection only upon removal of the current imbalance, the disconnecting and restoring means including

a first relay comprising a coil having one end for connection to ground, make contacts connecting the other end of the coil to the tip and ring paths, and break contacts in the tip and ring paths on the central office side of the make contacts, and

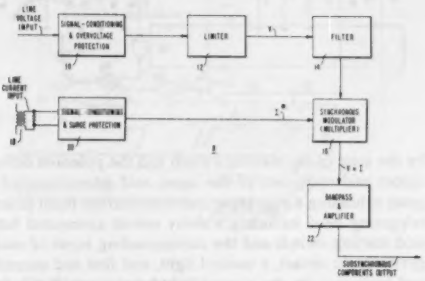
means in the circuit from the tip and ring paths to the coil for blocking the flow of current from one path to the other.

4,106,071

APPARATUS FOR PROTECTION AGAINST SUBSYNCHRONOUS CURRENTS IN A POWER SYSTEM

Shan C. Sun, Bell Township, Alleghany County, and Larry L. Church, Washington Township, Washington County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 6, 1977, Ser. No. 757,178
Int. Cl.[2] H02H *3/38*
U.S. Cl. 361—79 **12 Claims**



1. Apparatus for monitoring a power system for subsynchronous current oscillations having a predetermined frequency range of interest over a predetermined period of evaluation, said apparatus comprising:

first circuit means operably coupled to the power system for developing a signal representative of the subsynchronous current therein;

second circuit means operably coupled to said first circuit means for performing a full wave rectification of the subsynchronous current signal;

third circuit means operably coupled to said second circuit means for receiving said rectified signal and for detecting each pulse therein, said third circuit means being adapted to hold a predetermined pulse and to recognize and hold only those subsequent pulses which are greater in value than the held pulse by at least a predetermined magnitude, and for holding the value of each such recognized pulse at its output, said third circuit means being further adapted to be reset upon receipt of an appropriate resetting signal to discharge said held pulse and begin the detection of new pulses;

first comparator circuit means operably coupled to said third circuit means, including a first voltage reference threshold, for generating a first output signal whenever the value of said held pulse at the start of the period of evaluation reaches a predetermined level with respect to said first threshold;

fourth circuit means operably coupled to said third circuit means and said first comparator circuit means for comparing the value of said held pulse with a subsequent pulse, and for generating a pulse recognition signal whenever the magnitude of the subsequent pulse reaches a predetermined level with respect to the held pulse and a first signal is received from said first comparator circuit means;

second comparator circuit means operably coupled to said third circuit means, including a second voltage reference threshold, for generating a second output signal whenever the instantaneous value of said held pulse reaches a predetermined level with respect to said second threshold;

third comparator circuit means operably coupled to said third circuit means, including a third voltage reference threshold, for generating a third output signal whenever the value of said held pulse at the finish of the period of evaluation reaches a predetermined level with respect to said third threshold;

first timing circuit means operably coupled to said third and fourth circuit means to receive said pulse recognition signal and having a first timing period corresponding to the frequency at the low end of the subsynchronous frequency range of interest for generating a first resetting signal for said third circuit means whenever two successive recognizable pulses are separated in time of occurrence by a period less than said first timing period and for inhibiting generation of said first resetting signal whenever two successive recognizable pulses are separated in time of occurrence by a period greater than said first timing period;

second timing circuit means operably coupled to said third and fourth circuit means to receive said pulse recognition signal and having a second timing period corresponding to the frequency at the high end of the subsynchronous frequency range of interest for generating a second resetting signal for said third circuit means whenever two successive recognizable pulses are separated in time of occurrence by a period greater than said second timing period and for inhibiting generation of said second resetting signal whenever two successive recognizable pulses are separated in time of ocurrence by a period less than said second timing period;

third timing circuit means operably coupled to said first and second timing circuit means and having a third timing period equal to the predetermined period of evaluation for generating a fourth output signal whenever two successive recognizable pulses are separated in time of occurrence by a period greater than said first timing period and less than said second timing period at the conclusion of said third timing period; and

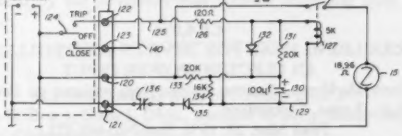
logic circuit means operably coupled to said first, second, and third comparator circuit means and said third timing circuit means for generating an output signal whenever said first, second, third and fourth output signals reach a predetermined logical relationship.

4,106,072

CONTROL SWITCH RELAY AND CONTROL CIRCUIT MEANS

Alexander MacLean, Hingham, Mass., assignor to Electro Switch Corp., Weymouth, Mass.

Division of Ser. No. 591,170, Jun. 27, 1975, Pat. No. 4,001,740.
This application Oct. 4, 1976, Ser. No. 729,114
Int. Cl.[2] H01H *47/22*
U.S. Cl. 361—156 **7 Claims**



1. A control circuit means for providing rapid actuation and slow release of a rotary solenoid,

said control circuit comprising,

a first circuit means for charging a capacitor while actuating a relay to actuate said rotary solenoid,

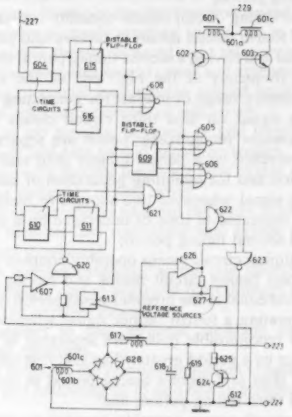
second circuit means for causing slow discharge of said capacitor to maintain said relay over a slow release period,
a second output means connected to said control circuit in parallel with said first means for charging said capacitor through a unilateral conduction device,
and switch means for selectively passing different levels of current to said second output means or directly to said capacitor.

4,106,073

APPARATUS FOR IGNITING THE MATCH HEADS OF ELECTRIC DETONATORS

John Bengt Göran Hedberg, Fregattgatan 13, Västra Frölunda, Sweden

Continuation of Ser. No. 409,242, Oct. 24, 1973, abandoned. This application Aug. 13, 1975, Ser. No. 604,154
Int. Cl.² F42B 3/10
U.S. Cl. 361—248 **5 Claims**



1. An apparatus for igniting the match heads of a plurality of series-connected electric detonators, comprising a dischargeable electric energy source electrically connected to the ends of the series of detonators and supplying the requisite amount of energy for simultaneous firing of the maximum number of detonators for which said apparatus is dimensioned during the period of discharge of said energy source, means electrically connected to said source and said detonators for regulating the current through the detonator match heads during the energy source discharge period so as to retain a substantially constant pre-determined current value irrespective of the number of detonators served by said apparatus, and means for initiating the discharge of said source, said current regulation means including means for interrupting the passage of current through the detonator match head before discharging the energy source to an extent sufficient to fire any of the detonators, should the energy stored in the energy source be insufficient for firing of all detonators connected to said source.

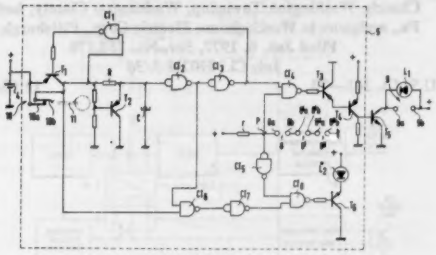
4,106,074

TRIGGERING HEAD FOR DEVICES CONTROLLED BY AN ELECTRIC POWER INPUT

Robert H. Conne, Geneva, Switzerland, assignor to Brevetor S.A., Vaduz, Switzerland

Filed Mar. 23, 1976, Ser. No. 669,472
Claims priority, application Switzerland, Oct. 23, 1975, 13729/75
Int. Cl.² F42B 3/10
U.S. Cl. 361—248 **12 Claims**

1. A triggering head for devices of the type operated by an electric power input comprising a case separate from the device to be operated containing at least one electric battery, a control circuit fed by the or each battery, and an electronic switching device connected to the control circuit for delivering the electric energy of the or each battery to a device to be triggered, the control circuit comprising an externally actuated starting switch and at least one double-pole input, the potential difference appearing across the end poles of which determines the state of the electronic switching device through the control circuit when the starting switch has been actuated, and wherein the case comprises an output plug for at least electrically connecting the triggering head to the device to be triggered, and the control circuit comprises a logic triggering circuit having a plurality of interconnected logic gates with stable switching levels and two inputs controlled respectively



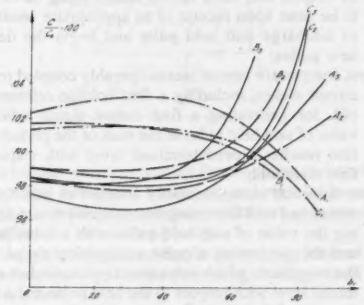
by the state of the starting switch and the potential difference across said end poles of the input, said interconnected logic gates exhibiting a high input impedance to the input poles, said triggering head including a delay circuit connected between said starting switch and the corresponding input of said triggering logic circuit, a control light, and first and second control logic circuits, the control light being controlled by means of said first control logic circuit, said first control logic circuit having two inputs controlled respectively by the potential difference across said end poles of the input and the state of the second control logic circuit, said second logic circuit having two inputs respectively controlled by the state of the starting switch and the state of the delay circuit.

4,106,075

CERAMIC CAPACITOR

Georg Baumann, Selb, and Helmut Hoffmann, Thiersheim, both of Germany, assignors to Draloric Electronic GmbH, Germany

Filed Mar. 17, 1976, Ser. No. 667,612
Int. Cl.² H01G 4/12
U.S. Cl. 361—320 **11 Claims**



1. A densely sintered ceramic dielectric with a loss factor of less than or equal to 10^{-3} and a substantially linear temperature dependence of the capacitance based on at least one member of

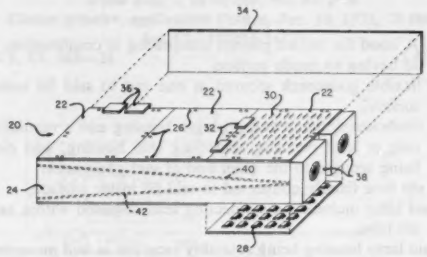
the group consisting of TiO_2, ZrO_2, and the compounds of (a) TiO_2, ZrO_2, SnO_2, Nb_2O_5 or Ta_2O_5, with (b) oxides of the alkali, alkaline earths or rare earths, characterized in that the chemical composition is between 50 and 97% by weight of a ceramic base material having a substantially linear temperature dependence of the dielectric constant and between 50 and 3% of at least one ($y_iB_iz_iM_i$) wherein the coefficients y_i and z_i represent integers of 1 to 5 and are in a stoichimetric relationship, B_i are oxides of the metal or alkaline earth metals of the groups II, IV*b* or V of the periodic system, and M_i represents at least one glass former selected from the group consisting of B_2O_3, P_2O_5 and SiO_2.

4,106,076

CIRCUIT MODULE

Robert Miller, Poway, and Paul L. Grundy, San Diego, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 12, 1976, Ser. No. 704,597
Int. Cl.[2] H05K *7/20*
U.S. Cl. 361—394 **10 Claims**



1. A circuit module comprising

a framework including first and second end bus elements having flanges on both sides for connecting printed circuit boards thereto, a central bus element having flanges on both sides thereof for connecting printed circuit boards thereto, a pair of connecting elements connecting one end bus element in spaced relation to each side of said central bus element, and means for electrically isolating the end bus elements from the central bus element;

at least one circuit board extending on each side between the end bus elements; and

means structurally and electrically connecting each circuit board to the flanges of each end bus element and the central bus element,

whereby electrical potential levels on each end bus element and the central bus element are applied to the circuit board through the connecting means.

4,106,077

TOP MOUNTED PHOTOFLASH ATTACHMENT FOR CAMERAS WITH SELF-DEVELOPING FILM

Dymetro P. Furda, Irvington, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation of Ser. No. 664,772, Mar. 8, 1976, abandoned. This application Sep. 22, 1977, Ser. No. 835,566
Int. Cl.[2] G03B *15/02, 15/03*
U.S. Cl. 362—8 **3 Claims**

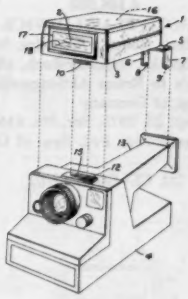
1. An improved photoflash attachment for use with a camera of the type having a flash bar receptacle and a view finder positioned at the top of said camera and offset from the center thereof, said view finder being substantially rectangular in at least a portion thereof and having a predetermined height and a predetermined width in said rectangular portion, said attachment comprising in combination:

a flash lamp and a power pack mounted in a unitary housing,

support means for supporting said housing on said camera,

said support means including a U-shaped support member having a base portion and a pair of resilient support arms extending from said base portion, said pair of support arms being spaced from each other a distance substantially equal to said predetermined width of said view finder,

said base portion connected to the bottom of said housing so that said support arms extend downwardly from the bottom of said housing and offset from the center of said



housing to clamp onto said view finder to support said housing, and

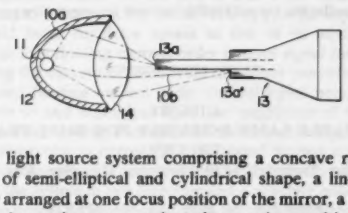
an electrical contact member protruding from the bottom of said housing and positioned to be inserted into said flash bar receptacle on said camera when said photoflash unit is mounted on the top of said camera.

4,106,078

LIGHT SOURCE SYSTEM

Yasuo Inoue, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Dec. 17, 1976, Ser. No. 751,946
Claims priority, application Japan, Dec. 27, 1975, 51-157115
Int. Cl.[2] F21V *7/04*
U.S. Cl. 362—32 **3 Claims**



1. A light source system comprising a concave reflecting mirror of semi-elliptical and cylindrical shape, a linear light emitter arranged at one focus position of the mirror, a cylindrical condenser lens arranged at the opening position of the mirror, a bundle of optical fibers, one part of one end surface of the fiber bundle being arranged at a condensing position of the portion of the light from the emitter reflected by the mirror and refracted by the condenser lens and the other part of one end surface of the fiber bundle being arranged at a condensing position of the portion of the light from the emitter directly refracted by the condenser lens without reflection from the mirror.

4,106,079

ILLUMINATED DRUM STICK, BATON

Lynn F. Drury, Stroud, Okla., assignor to John Eaton Wilkinson, Oklahoma City, Okla.

Filed Jan. 24, 1977, Ser. No. 761,851
Int. Cl.[2] F21K *2/00*
U.S. Cl. 362—34 **8 Claims**

1. An article adapted to be selectively illuminated and comprising body means constructed from a suitable transparent material, internal chamber means provided in said body means

and accessible from the exterior thereof for selectively receiving a suitable self-contained chemiluminescent capsule therein whereby said body may be manipulated for selectively activating said capsule for emitting lumination from the body.

4,106,080

PHOTO FLASH DEVICE

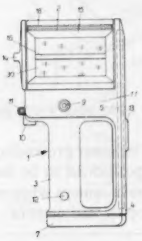
Hans Karey, Frankfurt; Robert Oberheim, Neu Isenburg, and Hans-Eberhard Heintke, Wachtersbach, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 25, 1975, Ser. No. 616,852

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1974, 2446024

Int. Cl.² G03B *15/02*

U.S. Cl. 362—18 **14 Claims**



1. In a photo flash device, a combination comprising housing means; a cylindrical reflector unit mounted for turning about its axis in said housing means, said reflector unit comprising a reflector, a cylindrically curved wall member embracing said reflector and said flash lamp and having at least two different light-emitting regions of different optical characteristics, and means for rotating said wall member; and a flash lamp positioned in said housing means so that flashes emitted by said lamp are reflected by said reflector unit in respective positions thereof.

4,106,081

DETACHABLE LAMP ASSEMBLY FOR DUAL TRAILER TRUCKS

Gaeton Ben Turturici, 6130 Monterey Rd., San Jose, Calif. 95111

Filed Jun. 20, 1977, Ser. No. 807,877

Int. Cl.² B60Q *1/00*

U.S. Cl. 362—61 **20 Claims**

1. A detachable lamp assembly for a truck trailer and successively attachable first and second trailers, said tractor comprising an electrical power system with headlamps, said first trailer comprising a rearwardly facing electrical connector, said electrical connector being electrically connected to the electrical power system of said tractor for receiving electrical power therefrom in response to the illumination of said headlamps, said electrical connector being formed with a plurality of electrical contacts, said second trailer being electrically connected to said first trailer through said electrical connector in response to said second trailer being attached to said first trailer, said detachable lamp assembly comprising:

(a) an electrical source of light; and

(b) a lamp assembly connector connected to said electrical source of light, said lamp assembly connector being mated with at least one of said contacts of said electrical connector of said first trailer to energize said electrical source of light in response to the illumination of said headlamps.

4,106,082

HOODS FOR RECORD PLAYERS AND OTHER SOUND RECORDING OR REPRODUCING APPARATUS

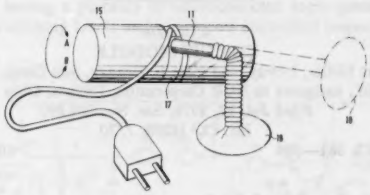
Rudolf Laeng; Benedikt A. Strausak, Merianweg 19, and Josef Vavrina, Steinhofstrasse 9, all of 3400 Burgdorf, Schweiz, Switzerland

Filed Aug. 18, 1976, Ser. No. 715,389

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1975, 2537084

Int. Cl.² G11B *1/04*

U.S. Cl. 362—87 **2 Claims**



1. A hood for record players comprising in combination:

a lid having an inside surface,

a flexible gooseneck secured at one end to said lid inside surface,

a stroboscopic lamp comprising a housing and a mounting ring at least partially encircling said housing, said ring being secured to the other end of said gooseneck,

a slit tube fixedly connected to said lid inside surface,

said lamp including a connecting lead disposed within said slit tube,

said lamp housing being rotatably received in said mounting ring so as to be rotatable with respect to said lid, and

tilt actuated switch means mounted within said housing and arranged so as to be actuated when said lid is raised and alternatively to be actuated when said lamp housing is rotated relative to said ring.

4,106,083

REFLECTOR FOR USE IN SUNLAMPS OR THE LIKE

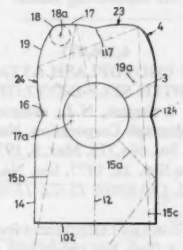
Friedrich Wolff, Bertholdstrasse 18, Frankfurt, Fed. Rep. of Germany

Filed Aug. 20, 1976, Ser. No. 716,254

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1975, 2537855

Int. Cl.² F21V *7/00*

U.S. Cl. 362—217 **34 Claims**



1. The combination of a rod-shaped radiation source, particularly a source of ultraviolet rays, with a substantially trough-shaped reflector having two halves which are substantially mirror symmetrical to each other with reference to a plane including the axis of said source, said reflector comprising a rear wall located behind said source and having a front surface facing said source, two side walls extending forwardly from said rear wall and flanking said source, said side walls having

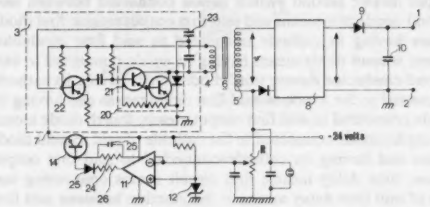
front portions which define an exit opening for the rays issuing from said source and rear portions adjacent to said rear wall and having concave inner surfaces facing each other, and two intermediate walls located between said rear portions and said rear wall and having concave inner surfaces merging into said front surface and into the inner surfaces of the respective rear portions, at least the major part of said source being located between said opening and said rear wall and each of said side walls defining with said source a relatively narrow gap.

4,106,084

MEANS FOR CONTROLLING THE ELECTRIC CURRENT DENSITY OF A HIGH TENSION DIRECT CURRENT SOURCE

Alain Gibert, Gan, France, assignor to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

Filed Jan. 7, 1976, Ser. No. 647,086
Claims priority, application France, Jan. 10, 1975, 75 00644
Int. Cl.[2] H02M *3/335*
U.S. Cl. 363—21 **1 Claim**



1. A current regulated with high voltage power supply, comprising:

a transformer having a low voltage primary winding and a high voltage secondary winding:

a current sampling circuit coupled to said secondary winding for providing a first D.C. voltage dependent upon the current flowing through said secondary winding:

rectifying and filtering means for coupling said secondary winding to a high voltage load:

means for comparing said first voltage with a reference voltage to produce a current control signal at a control terminal thereof which varies in accordance with the difference between said first and reference voltages;

a transistor oscillator having at least one power supply terminal and including a resonant circuit having inductive and capacitive elements, the primary winding of said transformer comprising the inductive element of said resonant circuit, said oscillator including a transistor amplifier having an output terminal DC coupled to said resonant circuit and an input terminal coupled to said resonant circuit via a feedback capacitor connected between said input terminal and said power supply terminal, the current through said primary and secondary windings being dependent upon the amplitude of oscillations developed by said oscillator; and

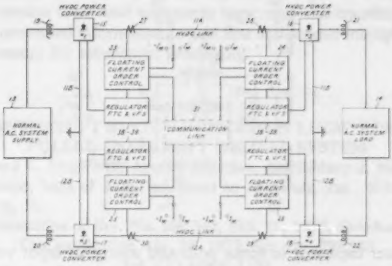
a variable transistor power supply circuit including a variable impedance control transistor having two main electrodes coupled in series between a fixed voltage supply terminal and said power supply terminal and a control electrode coupled to said control terminal for varying the supply voltage to said oscillator in accordance with said current control signal to thereby vary the amplitude of said oscillations so as to maintain the current flowing through said secondary winding at a desired value.

4,106,085

HVDC FLOATING CURRENT ORDER SYSTEM

Donald M. Demarest, Wallingford, and Bernard D. Leete, Newtown Square, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Dec. 27, 1976, Ser. No. 754,475
Int. Cl.[2] H02M *5/45*
U.S. Cl. 363—51 **34 Claims**



1. In an HVDC electric power delivery system including power converter means at each terminal of the system; each converter means comprising: a plurality of controllable electric valves connected between alternating current and direct current electric power conductors, means for cyclically firing said valves in a predetermined sequence and at firing angles measured with respect to the alternating voltage that can be varied to control the flow of power between said alternating current and direct current power conductors, and regulator means for comparing a plurality of control signals which respectively represent different operating characteristics of the HVDC system during operation and for deriving an output error control signal for controlling the firing angle of said valves, the regulator means associated with one of said converter means receiving as one input a current order control signal for controlling the current transmitted by said system; the improvement comprising:

(a) floating current order control means coupled to the regulator means of the power converter means not in control of current for the HVDC system for supplying to said latter regulator means as one of its input control signals a floating current order control signal for controlling the current ordered from said latter converter means,

(b) said floating current order control signal being responsive to and dependent upon the magnitude of the direct current flowing through said direct current power conductor plus a current margin signal having a predetermined magnitude and a positive polarity with power flow in the system in one direction and a negative polarity with the power flow in the system in the opposite direction, and

(c) said floating current order control means and the regulator means associated therewith being capable of acting to control the current ordered from said latter converter means without relying upon receipt of said current order control signal at said latter converter means.

4,106,086

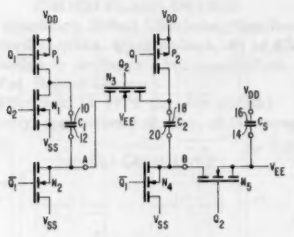
VOLTAGE MULTIPLIER CIRCUIT

Mark Denton Holbrook, Belle Mead, and Richard Plumb Fillmore, Plainfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,612
Int. Cl.[2] H02M *7/00*
U.S. Cl. 363—60 **1 Claim**

1. In a voltage multiplier circuit comprising a source of input voltage, a storage capacitor across which output voltage that is a multiple of input voltage is made available, at least one booster capacitor, control signal generator means for cyclically generating a first control signal followed by a second control signal, said first and said second control signals for

governing charging and dumping portion of an operating cycle respectively, a first set of electronically controlled switch means conductive responsive to said first control signal to connect each booster capacitor across said source of input voltage for charging and being otherwise non-conductive, and a second set of electronically controlled switch means conductive responsive to said second control signal to connect each



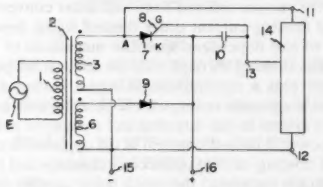
booster capacitor in series with said source of input voltage across said storage capacitor for transferring charge to said storage capacitor and being otherwise non-conductive, the improvement wherein said control signal generator is of a type for providing an interval between said first and second control signals in each cycle and for providing an interval between said second control signal in each cycle and the first control signal in the succeeding cycle.

4,106,087

POWER-SUPPLY DEVICE FOR WORKING MACHINE SUCH AS A SPARK-EROSION MACHINE

Tomonori Kawasaki, 4-3 Momoyama-cho, Dairi, Moji-ku, Kitakyushu-shi, Fukuoka-ken, Japan

Filed Nov. 3, 1976, Ser. No. 738,253
Claims priority, application Japan, Nov. 5, 1975, 50-133443
Int. Cl.² H02M *7/08, 7/155*
U.S. Cl. 363—70 **5 Claims**



1. Power-supply device for a working machine such as a spark-erosion machine, arc welding machine or the like comprising:

(1) a power transformer having a main secondary circuit and an auxiliary secondary circuit, said main secondary circuit and said auxiliary secondary circuit being respectively provided with additional normal and inverse turns in addition to the desired number of normal turns which generates desired output current,

(2) a thyrister rectifying circuit having a first thyrister, said thyrister rectifying circuit being connected to said main secondary circuit,

(3) a diode rectifying circuit connected to said auxiliary secondary circuit parallel to said thyrister rectifying circuit, and

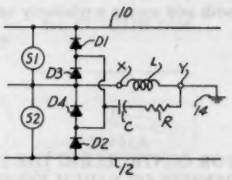
(4) a first trigger circuit for triggering said first thyrister of said thyrister rectifying circuit.

4,106,088

CURRENT DRIVE CIRCUITS

Kenneth N. Bergan, Minnetonka, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Sep. 15, 1977, Ser. No. 833,534
Int. Cl.² H02M *7/00*
U.S. Cl. 363—132 **4 Claims**



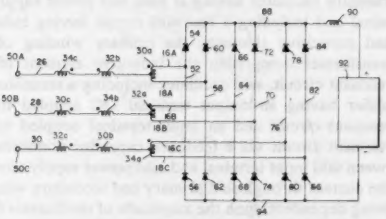
1. A current drive circuit for an inductive load comprising: first conductor means for connection to a source of positive voltage; second conductor means for connection to a source of negative voltage; first output means for connection to one side of said inductive load; second output means for connection to the opposite side of said inductive load; first switch means connected between said first conductor means and said first output means; second switch means connected between said second conductor means and said first output means; first diode means having its cathode connected to said first conductor means; second diode means having its anode connected to said second conductor means; third diode means having its cathode connected to the anode of said first diode means and having its anode connected to said first output means; fourth diode means having its anode connected to the cathode of said second diode means and having its cathode connected to said first output means; time delay means; first circuit means connecting one side of said time delay means to the junction between said first and third diode means and to the junction between said second and fourth diode means; and second circuit means connecting the opposite side of said time delay means to said second output means.

4,106,089

ALTERNATING CURRENT POWER DIVIDING OR COMBINING SYSTEM

Paul I. Fettinger, Garden Grove, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Sep. 10, 1976, Ser. No. 722,184
Int. Cl.² H02M *5/14*
U.S. Cl. 363—153 **5 Claims**



1. A transformer of relatively low VA rating for converting an N phase input waveform to an M phase output waveform wherein M is an integer and N is an integer not less than three, said transformer comprising:

primary winding means having at least two coils operatively associated with each phase;

secondary coil means operatively associated with each phase and having a center connection and end connections; and

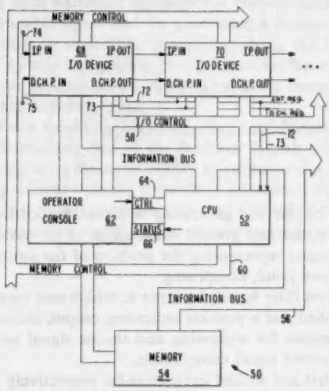
means for connecting one of said primary winding means

coils of a first phase to one of said primary winding means coils of a second phase in series opposition and to said center connection of said secondary coil means of a third phase.

4,106,090
MONOLITHIC MICROCOMPUTER CENTRAL PROCESSOR

Charles R. Erickson, Fremont; Hemraj K. Hingarh; Robert Moeckel, both of Santa Clara, and Dan Wilnai, Sunnyvale, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jan. 17, 1977, Ser. No. 760,063
Int. Cl.[2] G06F *7/48*
U.S. Cl. 364—200 **5 Claims**



1. For use in a computing system which includes a processing unit, at least one memory unit external to the processing unit for storing a program and data to be processed in said processing unit in response to said program, and peripheral equipment operably connected to said system for access with the processing unit,

a monolithic semiconductor integrated central processing unit comprising:

(a) an information bus for bidirectionally communicating instructions and data between said central processing unit and the memory unit and peripheral equipment;

(b) first storage means operably connected to said information bus for receiving and storing program instructions to be executed;

(c) first multiplexer means operably connected to said first storage means to receive memory address information;

(d) second storage means operably connected to said information bus for receiving and storing data and address information;

(e) second multiplexer means operably connected to said second storage means for receiving the stored data and address information to be processed;

(f) control means including a program logic array and sequence state logic and operably connected to said first storage means for receiving a program instruction by said program logic array and generating a plurality of microprogram control codes for controlling processor operation in executing said program instruction;

(g) a program counter means operably connected to said program logic array of said control means and which is operative to receive the memory addresses of the next program instructions to be executed and including incrementing means to obtain the address of subsequent instructions which are to be executed;

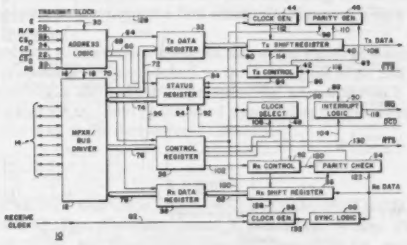
(h) a time multiplexed arithmetic logic unit operably connected to said first multiplexer means and said second multiplexer means for receiving memory address information and generating real memory addresses and for receiving data to be processed, said arithmetic logic unit operably connected to said control means for receiving control signals for data manipulation, and said arithmetic logic unit having means operably connected to said program counter to provide said next program instruction memory addresses; and

(i) accumulator means including a plurality of shift registers operably connected to receive and store processed information from said arithmetic logic unit and transfer said processed information to said first and second multiplexer means for subsequent processing.

4,106,091
INTERRUPT STATUS INDICATION LOGIC FOR POLLED INTERRUPT DIGITAL SYSTEM

Edward C. Hepworth, Apache Junction, and Rodney J. Means, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 550,340, Feb. 18, 1975, abandoned. This application Apr. 29, 1977, Ser. No. 792,180
Int. Cl.[2] G06F *3/00*
U.S. Cl. 364—200 **5 Claims**



1. An interface adaptor for interfacing between a peripheral device and a processor means, said interface adaptor being coupled to said processor means with a first external data bus and to said peripheral device with a second external data bus, said interface adaptor comprising:

a plurality of first data bus terminals for coupling said interface adaptor to said first external data bus;

a first internal data bus coupled to said first data bus terminals;

a plurality of second data bus terminals for coupling said interface adaptor to said second external data bus;

a second internal data bus coupled to said second data bus terminals;

first register storage means coupled to said second internal data bus for receiving first serial data from said peripheral device;

first circuit means coupled to said first register storage means for detecting when said first register storage means is full;

status register storage means comprising a plurality of status bits, said status register storage means being coupled to said first internal data bus and responsive to said first circuit means for storing first information indicative of whether said first register storage means is full as a first status bit therein, said status register storage means being addressable by said processor means and including means for transferring said first information to said processor means via said first internal data bus, said first data bus terminals, and said first external data bus upon interrogation by said processor means;

address means responsive to said processor means and coupled to said status register storage means for effecting said addressing of said status register means;

an interrupt request conductor coupled to said processor means;

interrupt means responsive to said status register storage means and coupled to said status register storage means and to said interrupt request conductor for generating an interrupt request signal on said interrupt request conductor in response to said storing of said first information.

4,106,092

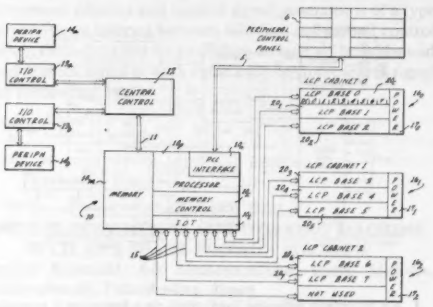
INTERFACE SYSTEM PROVIDING INTERFACES TO CENTRAL PROCESSING UNIT AND MODULAR PROCESSOR-CONTROLLERS FOR AN INPUT-OUTPUT SUBSYSTEM

Donald Alexander Millers, II., San Clemente, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 728,455, Sep. 30, 1976, abandoned. This application Sep. 29, 1977, Ser. No. 837,918

Int. Cl.[2] G06F *3/04, 9/06, 13/00, 15/20*

U.S. Cl. 364—200 **17 Claims**



1. In a digital processing system for controlling the transfer of data between a plurality of peripheral units and a main host system which includes a main memory and main processor, wherein each peripheral unit is controlled by a Line Control Processor, and a plurality of Line Control Processors are organized into a Base Module, and a plurality of such Base Modules are connected to said main host system through individual message level interfaces, an input-output translator interface unit in said main system for interfacing said plurality of Base Modules and Line Control Processors, said input-output translator interface comprising:

(a) means to receive a plurality of input-output instructions from said processor and main memory and to receive address signals for selecting a particular Base Module and particular Line Control Processor for establishing communcations with a particular peripheral unit;

(b) connection means to establish a data path from said main system to an addressed Line Control Processor;

(c) data transfer means to transfer control data and information data between main memory and an addressed Line Control Processor;

(d) means to assemble a descriptor link signal to serve as an identifier for each specific input-output data transfer cycle instruction from said main procesor;

(e) scratchpad memory means having a particular portion of its memory reserved for each Line Control Processor, said scratchpad memory storing the beginning and ending addresses of any given data field in main memory plus reserved scratchpad memory sections in each portion for signal information as to the status of each input-output transfer cycle command initiated by said main processor.

4,106,093

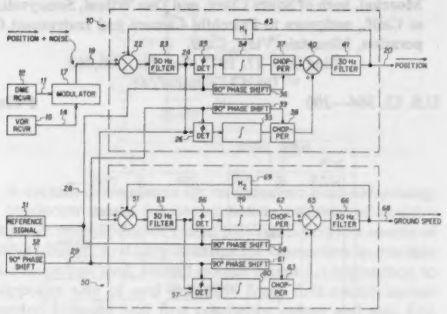
GROUND SPEED DERIVING CIRCUIT

Donald K. Grimm, Cedar Rapids, Iowa; Wayne A. Savold, Satellite Beach, and Allen R. Walter, Melbourne, both of Fla., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 24, 1977, Ser. No. 809,596

Int. Cl.[2] G06G *7/78*

U.S. Cl. 364—424 **5 Claims**



3. A circuit for generating a signal proportional to the ground speed and ground track angle of an aircraft from a vector signal representing the position of the aircraft relative to a known point, comprising:

A. a first filter having an input to which said vector signal is applied and a position indicating output, including:

1. means for separating said vector signal into first and second signal components,

2. first and second integrators for respectively integrating the first and the second signal components,

3. means for adding the integrated signal components to constitute the position indicating output,

4. means for feeding back the position indicating output to the input of said first filter,

B. and a second filter having an input connected to sample an input to said integrators to produce a signal proportional to the ground speed of the aircraft.

4,106,094

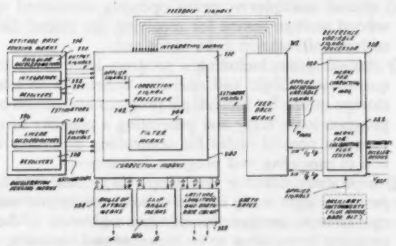
STRAP-DOWN ATTITUDE AND HEADING REFERENCE SYSTEM

Robert Perry Land, Los Angeles, Calif., assignor to Turpin Systems Company, Van Nuys, Calif.

Filed Dec. 13, 1976, Ser. No. 749,928

Int. Cl.[2] G06F *15/50;* **G06G** *7/78;* **G05D** *1/00*

U.S. Cl. 364—453 **19 Claims**



1. An attitude and heading reference system for use in a moving vehicle to provide signals representing estimates of earth-oriented motion-related variables, and to correct predetermined ones of those estimator signals by comparing them

with corresponding applied reference variable signals, said attitude and heading reference system comprising:

attitude rate sensing means for producing output signals representing components of the angular velocity of the vehicle about a set of earth-oriented axes;

acceleration sensing means for producing output acceleration signals reepresenting linear accelerations of the vehicle along earth-oriented axes;

integrating means connected to said attitude rate sensing means and said acceleration sensing means for integrating their output signals to produce estimator signals representing estimates of predetermined earth-oriented motion-related variables;

feedback means responsive to the applied reference variable signals and connected to said integrating means for comparing each estimator signal with a corresponding reference variable signal and for generating a feedback signal dependent on their difference and applying the feedback signal to said integrating means to cause the estimator signal to become substantially equal to its correponding reference variable signal;

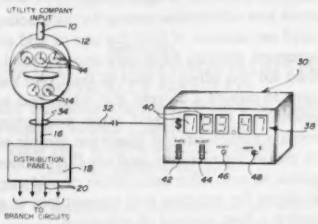
said feedback means further comprising means responsive to a predetermined one of the feedback signals applied to said integrating means to modify an estimator signal representing a linear velocity to produce a feedback signal and to apply it to said integrating means to modify a predetermined estimator signal representing an attitude angle.

4,106,095

ELECTRICAL USAGE DISPLAY SYSTEM

Grover A. Yarbrough, Lewisville, Tex., assignor to Electronic Data Systems, Inc., Dallas, Tex.

Filed May 31, 1977, Ser. No. 801,721
Int. Cl.² G01R *13/00;* H04M *11/04*
U.S. Cl. 364—464 **28 Claims**



1. A system for displaying a cumulative indication of electricity usage to a consumer comprising:

inductive coil means for being disposed adjacent an electrical supply line for generating a signal representative of the current flowing through the electrical supply line;

means for periodically generating digital signals representative of the magnitude of said signal;

computing means for receiving said digital signals and for generating periodic output signals representative of a cumulative number of said digital signals; and

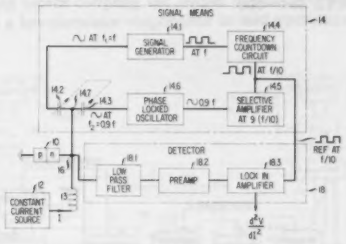
display means connected to said computing means for displaying to the comsumer a cumulative indication of the electricity usage.

4,106,096

DERIVATIVE MEASUREMENT BY FREQUENCY MIXING

Thomas Lee Paoli, Basking Ridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 30, 1976, Ser. No. 718,403
Int. Cl.² G06G *7/18;* G01R *19/00*
U.S. Cl. 364—481 **5 Claims**



1. A method of generating the n-th order ($n \geq 2$) derivative of a parameter of a nonlinear device comprising the steps of:

applying to the device a first sinusoidal signal at a first frequency f_1

applying to the device a second sinusoidal signal at a second frequency f_2 phase-locked to the first signal at f_1, and

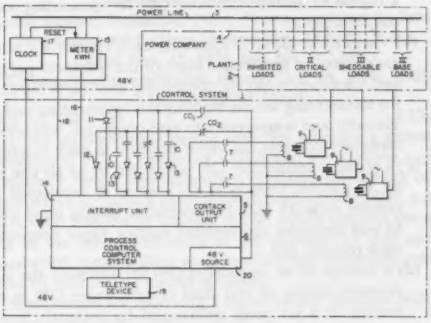
detecting a third signal corresponding to a difference frequency f_d of f_1 and f_2, the third signal being proportional to the n-th order derivative.

4,106,097

ENERGY CONSERVATION CONTROL METHOD

Richard Q. Fox, Orlando; James I. Millholen, Winter Park, both of Fla., and John H. McWhirter, Penn Hills, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1977, Ser. No. 791,741
Int. Cl.² G06F *15/06;* G05B *15/00*
U.S. Cl. 364—492 **7 Claims**



1. A method of controlling the operating status of the loads in a plant facility having production loads and nonproduction loads supplied with energy from a utility company, with said production loads being capable of being switched selectively in accordance with a desired production activity level and said nonproduction loads being operative under selected constraints, comprising the steps of:

deriving as a function of time an indication of the actual demand of energy by said plant facility; and

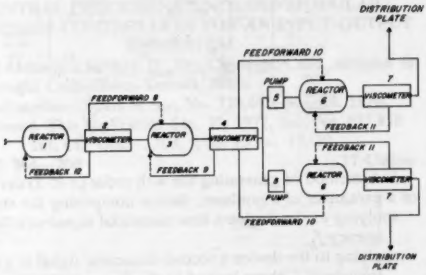
altering said constraints in relation to the derived indication of the actual demand of energy to establish constraints compatible with different levels of production activity in said plant facility.

4,106,098

COMPUTER CONTROLLED APPARATUS FOR PREPARATION OF POLYETHYLENE TEREPHTHALATE

Asa Carlyle Moody, Jr., Colonial Heights; Richard George Kenward, Richmond, and James William Shiver, Midlothian, all of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Feb. 2, 1977, Ser. No. 764,795
Int. Cl.[2] G06F *15/46*
U.S. Cl. 364—500 3 Claims



1. Apparatus comprising three reactors (1, 3, 6) connected in series arrangement for polycondensation of molten polyethylene terephthalate polyester, each reactor having a final control valve (28) for setting the vapor pressure therein, in combination with control apparatus for automatically controlling intrinsic viscosity of the polyethylene terephthalate polyester exiting from said reactors comprising:

(a) a digital computer (30) having an analog input section (23) for accepting analog input signals; a central processor (24) for processing said analog input signals by relating said input signals to an anticipatory control program; and a digital to analog converter (25) for generating analog output signals;

(b) viscometers (2, 4, 7) following each reactor for sensing melt viscosity and temperature of the polyester polymer, said viscometers having connecting lines (8, 9, 10, 11, 12) for transmitting analog input signals representing said melt viscosity and temperature to said computer, whereby the computer controls the vapor pressure in each reactor;

(c) a pressure transmitter (20) connected by an air line to an air to current transducer (21) which is connected to a resistor network (22), for generating analog input signals to said computer representing reactor vapor pressure for each reactor; and

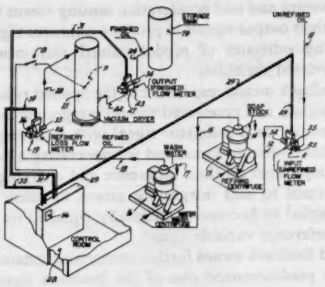
(d) a voltage to air transducer (26) for adjusting the vapor pressure setting of said final control valve (28) in each reactor to a set point determined by currently existing intrinsic viscosity calculated by the computer (30) from melt viscosity and temperature of said polymer, compared to the last previous determination of intrinsic viscosity of said polymer; and by last previous calculated vapor pressure set point, constants for proportional gain, integral time and derivative time, and desired intrinsic viscosity of exiting polymer minus intrinsic viscosity of exiting polymer at last two previous times of measurement, and by time intervals between measurements and currently existing set point for vapor pressure within said reactor, these relations being solved by said computer which thereupon generates signals to which said vapor pressure final control valve (28) is responsive.

4,106,099

REFINERY AND PIPELINE MONITORING SYSTEM

Peter F. Elliott, and Kenneth D. Elliott, both of P.O. Box 31227, Cincinnati, Ohio 45231

Continuation-in-part of Ser. No. 704,538, Jul. 12, 1976. This application Jul. 8, 1977, Ser. No. 814,132
Int. Cl.[2] G01M *3/28;* G01F *1/00;* G06F *15/46*
U.S. Cl. 364—510 6 Claims



1. Apparatus for monitoring losses in a fluid flow system, such as a refinery or pipeline, comprising:

at least two measurement stations located at separate positions along a fluid flow path, each said measurement station having means for measuring data related to fluid flowing through said fluid flow path at said separate positions during a series of intervals of operation of said fluid flow system,

said data including a gross amount of fluid which has flowed past each said measurement station during each interval of said series of intervals of operation,

memory means for storing information related to accuracy of operation of said data measuring means and information related to physical properties of said fluid,

sample number selector means for entering a preselected non-zero number,

net fluid calculation means responsive to said data and information for calculating a net amount of fluid,

net fluid amount accumulator means for accumulating a net amount of fluid which has flowed past each of said at least two measurement stations during each interval of said series of intervals of operation,

current loss calculation means for subtracting said accumulated net amount of fluid for one of said at least two measurement stations from said accumulated net amount of fluid for the other of said at least two measurement stations to signify a current loss when said accumulated net amount of fluid for said other measurement station exceeds a predetermined minimum sample amount,

reset means for resetting said net fluid amount accumulator means to zero after calculation of said current loss,

first means for entering said current loss as a reference loss during a first interval of operation,

said reference loss signifying a loss indication for said first interval of operation,

increment calculation means responsive to said preselected number for dividing said current loss by said preselected number to signify an increment during subsequent intervals of operation,

loss indication calculation means for adding said increment to said reference loss during said subsequent intervals of operation to signify a loss indication for each of said subsequent intervals of operation, and

means for displaying said loss indications,

whereby a surge in the operation of said fluid flow system which occurs during any of said subsequent intervals of operation is distributed over a number of intervals of

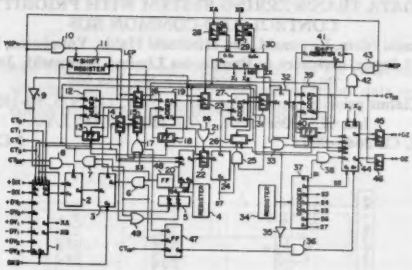
operation equal to said preselected number so as to smooth each said surge over a series of loss indications.

4,106,100

DIGITAL DIFFERENTIAL ANALYZER

Kunihiro Okada; Yoshiharu Itatsuda; Takeyuki Endoh; Shigeru Yabuuchi, all of Tokyo, and Norio Yokozawa, Fuchu, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of, Japan

Filed Mar. 23, 1977, Ser. No. 780,457
Claims priority, application Japan, Mar. 24, 1976, 51-31338
Int. Cl.[2] G06J *1/02;* G06F *7/38*
U.S. Cl. 364—702 **14 Claims**



12. A digital differential analyzer comprising:

input means for successively applying input data;

first arithmetic operation means for performing an arithmetic operation in response to the input data from said input means;

memory means connected to said first arithmetic operation means for temporarily storing the result of the arithmetic operation by said first arithmetic operation means;

second arithmetic operation means connected to said memory means for performing an arithmetic operation in response to the contents of said memory means; and

control means connected to said first and second arithmetic operation means for controlling said first and second arithmetic operation means so that, during a period when said second arithmetic operation means performs an arithmetic operation related to preceding input data, said first arithmetic operation means performs an arithmetic operation related to subsequent input data.

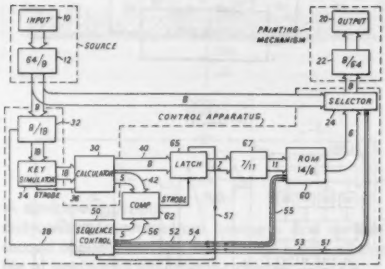
4,106,101

TYPEWRITER-CALCULATOR COMBINATION FOR THE PHYSICALLY DISABLED

Leslie Herbert Raymond Harrison, Wimborne, England, assignor to Possum Controls Limited, England

Filed Dec. 1, 1976, Ser. No. 746,606
Int. Cl.[2] G06F *3/02, 3/10*
U.S. Cl. 364—709 **4 Claims**

1. Apparatus comprising in combination an electric typewriter, an electronic calculator, a source of operator-selectable signals representative of alpha-numberic characters and operator-selectable signals representative of calculator command signals including at least the command signals "CLEAR", "+", "−", "X", "÷", "DECIMAL POINT" and "ANSWER", and control apparatus coupled to said source, said calculator and said typewriter, said source including a first code-converter to convert operator-selected alpha-numeric and calculator command signals into a secondary coded form, said typewriter including a second code-converter to convert signals in said secondary coded form into signals to operate said typewriter, and said control apparatus comprising a selector coupled on the one hand between the output of said first code-converter and the input of said second code-converter and on the other hand between the output of said calculator and the input of said second code-converter, said selector having a first normal setting in which signals from the output of the first code-converter are applied to the input of the second code-converter while preventing application of output from said calculator to the input of said second code-converter, and having a second setting selectable by said operator-selected "ANSWER" command signal to couple the output of said calculator to the input of said second code-converter and enabling the output from said calculator to be automatically typed by said typewriter, and said control apparatus further comprising means coupling the output of said first code-converter to a key-simulator responsible to said operator-selecta-



ble signals representative of numeric characters and calculator command signals as encoded by said first code-converter for simulating calculatorkey-signals and applying the last said signals to said calculator through connections individual to the digits ϕ and 1 through 9 and at least the command signals "DECIMAL POINT", "+", "−", "X", "÷", "CLEAR" and "=", whereby the conventional calculations of addition, subtraction, multiplication, and division can be effected under direct operator control and the result automatically typed when the "ANSWER" command signal is selected by the operator.

4,106,102

SELF-ADAPTIVE DIGITAL FILTER FOR NOISE AND PHASE JITTER REDUCTION

André Eugène Desblache, Nice, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 15, 1976, Ser. No. 742,150
Claims priority, application France, Dec. 18, 1975, 75 39629
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—724 **3 Claims**

1. An auto-adaptive digital filter for tracking a sinusoidal component F*i* of a frequency which may vary within a given frequency range, said auto-adaptive digital filter being of the type which includes a narrow bandwidth tunable filter, a feedback loop comprising a tuning circuit which controls the shifting of the center frequency of the passband of said narrow bandwidth tunable filter so as to track said sinusoidal component F*i*, said tuning circuit including:

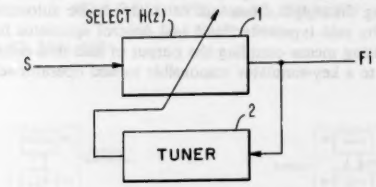
input means for receiving a signal passed through said narrow bandwidth tunable filter;

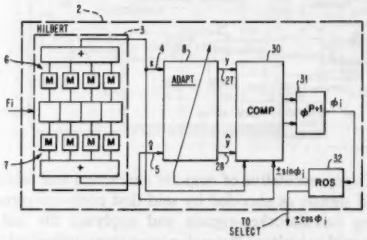
a narrow band Hilbert type filter connected to said input means and producing two in-quadrature components x and x;

a variable bandwidth filtering means connected to said narrow band Hilbert type filter to receive said in-quadrature components x and x and to produce two in-quadrature signals y and y, said variable bandwidth filtering means having a z-transfer function in the form

$$\frac{z - e^{j\phi i}}{z - de^{j\phi i}}$$

where
$\phi i = 2\pi fiT$,
T is the period of the digital samples fed to the input of said variable bandwidth filtering means, and
d is a constant close to "1," computing means connected to receive the outputs of said narrow band filter and of said





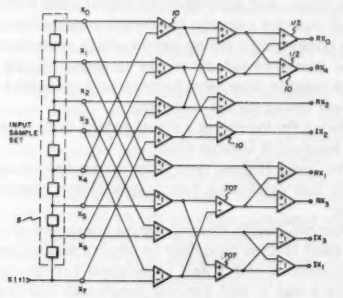
variable bandwidth filtering means for determining an average error from factors x, x, y, and y; and
an adjusting means connected to the output of said computing means to receive the information supplied by said computing means and acting to adjust said variable bandwidth filtering means and said narrow bandwidth tunable filter so as to minimize said average error.

4,106,103

DERIVATION OF DISCRETE FOURIER TRANSFORM COMPONENTS OF A TIME DEPENDENT SIGNAL

Donald A. Perreault, Thousand Oaks, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 19, 1976, Ser. No. 706,702
Int. Cl.² G06F *7/38*
U.S. Cl. 364—827 **20 Claims**



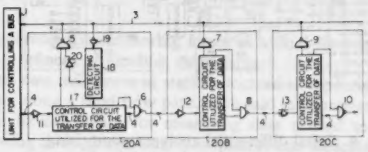
1. Apparatus for providing the discrete Fourier transform (DFT) components of a time dependent signal $x(t)$ comprising:
(a) means for sampling said signal $x(t)$ to provide a plurality of sets, i, of sample values x_k, $k = 0, 1 \ldots N-1$, said values x_k corresponding to components of samples of the signal $x(t)$ time displaced by an amount T/N from one another where T is a sample time frame and N is an even integer,
(b) said sampling means providing the i^{th} sample set time delayed from the $i\text{-}1^{th}$ sample set by an amount t_0 where $0 < t_0 \leqq T/N$, thereby providing an overlapping sliding window sampling of said signal $x(t)$, and
(c) means for generating the DFT components X_n corresponding to each sample set of values x_k of said plurality of sample sets for n belonging to one of the groups $n = 0, 1 \ldots N/2$ and $n = 0, N/2, N/2 + 1, N/2 + 2, \ldots N-1$.

4,106,104

DATA TRANSFERRING SYSTEM WITH PRIORITY CONTROL AND COMMON BUS

Atsushi Nitta, Kawasaki, and Hirotoshi Haida, Yokohama, both of Japan, assignors to Panafacom Limited, Kawasaki, Japan

Filed Nov. 4, 1976, Ser. No. 738,959
Claims priority, application Japan, Nov. 11, 1975, 50-135508
Int. Cl.² G06F *3/04, 9/18;* H04Q *3/00, 5/00*
U.S. Cl. 364—900 **1 Claim**


UNIT FOR CONTROLLING A BUS
DETECTING CIRCUIT
CONTROL CIRCUIT UTILIZED FOR THE TRANSFER OF DATA
CONTROL CIRCUIT UTILIZED FOR THE TRANSFER OF DATA
CONTROL CIRCUIT UTILIZED FOR THE TRANSFER OF DATA
20A
20B
20C

1. A data transferring system comprised of a plurality of devices which use a common bus, each of said devices providing a requesting signal to a requesting signal line for requesting a transfer of data, and means associated with said devices for assigning a priority order to the transference of the data; and a control unit commonly provided for said plurality of devices so as to control said common bus, said control unit receiving said requesting signal on said requesting signal line and then sending an acknowledging signal for said transfer of data, each of said plurality of devices receiving said acknowledging signal so that the device which sends out said requesting signal carries out the transfer of data, at least one of said plurality of devices, except for the device having the highest priority order, including a detecting circuit for detecting said requesting signal on said requesting signal line, wherein said device providing said detecting circuit detects said requesting signal so that said device providing said detecting circuit prevents the sending out of said requesting signal from its own device and said device which is prevented from sending out said requesting signal by said detecting circuit transfers said acknowledging signal to a following device; and at least one of said plurality of said devices, except for the device having said detecting circuit, is placed on the opposite side of said control unit with respect to said device having said detecting circuit.

4,106,105

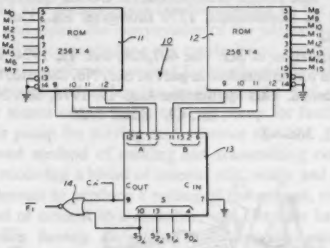
ZERO DETECTOR

John William Pross, Jr., Newfoundland, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Feb. 28, 1977, Ser. No. 772,708
Int. Cl.² G11C *7/00*
U.S. Cl. 364—900 **10 Claims**

1. A zero detector comprising:
means for encoding an input data word containing a number of zero and one bits into two sets of output data bits containing zero and one bits each of said sets of output data bits being a lesser number of bits than the number of bits in said input data word, said sets of output data bits representing the number of zero bits in said input data word,

means for summing said bits in each set of output data bits, and



means responsive to said summing means for determining whether the total number of zeros in said input data words equals or exceeds the number of one bits.

4,106,106

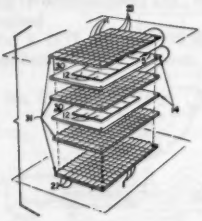
UNIFORM ROTATING FIELD NETWORK STRUCTURE TO EFFICIENTLY PACKAGE A MAGNETIC BUBBLE DOMAIN MEMORY

Ronald G. Wolfshagen, Newport Beach; John E. Ypma, Anaheim; Glen W. Murray, Irvine, and Thomas T. Chen, Yorba Linda, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 548,943, Feb. 11, 1975, abandoned. This application Mar. 16, 1976, Ser. No. 667,338

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—2 **16 Claims**



1. An open coil field network comprising:

at least first and second core means aligned in substantially adjacent planes with respect to one another;

coil means having terminal means,

said coil means wound respectively around each of said first and second core means;

said terminal means adapted to receive a signal to energize said coil means and thereby induce a magnetic field between said adjacent first and second core means having a planar direction substantially coincident with that of said core means; and

at least one magnetic bubble domain device disposed in the induced magnetic field between said adjacent first and second core means.

4,106,107

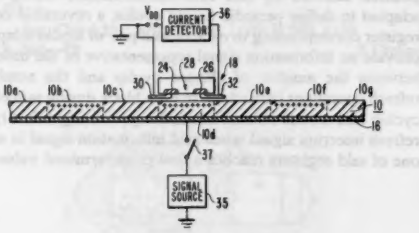
MIS READOUT DEVICE WITH DIELECTRIC STORAGE MEDIUM

Alvin Malcolm Goodman, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 3, 1977, Ser. No. 765,293

Int. Cl.[2] G11C *7/00, 11/34*

U.S. Cl. 365—191 **10 Claims**



1. A device comprising:

a dielectric storage medium having a first surface and a second opposite surface, said storage medium being capable of holding an electrostatic charge;

an electrically conductive sheet disposed adjacent said first surface;

a substrate of semiconductive material having a source region and a drain region formed therein and with a channel region therebetween, said second surface being removably placed adjacent to said substrate;

means for applying an interrogation signal to said conductive sheet; and

means for detecting a current flow between said source region and said drain region.

4,106,108

SEMICONDUCTOR DYNAMIC MEMORY AND RELATED REFRESHING SYSTEM

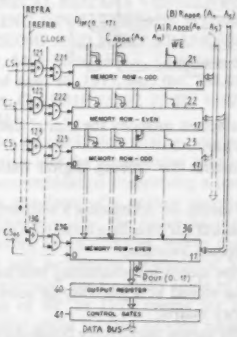
Ezio Cislaghi, Ossona (Mi); Alessandro Scotti, Cornaredo (Mi), and Renzo Pederzini, Melegnano (Mi), all of Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Filed Aug. 13, 1976, Ser. No. 714,177

Claims priority, application Italy, Aug. 20, 1975, 26447 A/75

Int. Cl.[2] G11C *7/00*

U.S. Cl. 365—222 **7 Claims**



1. A rechargeable memory comprising a plurality of individually addressable storage positions organized into rows and columns; said memory being organized into a pair of blocks each including a plurality of said rows; first circuit means for addressing a selected storage position to perform a read-write operation therein; second circuit means for sequentially ad-

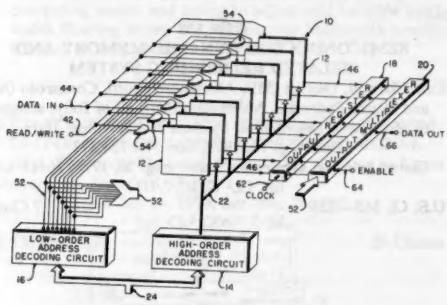
dressing said rows of storage positions in a first one of said pair of blocks; third circuit means for sequentially addressing said rows of storage positions in the second one of said pair of blocks; first control means for performing a refresh operation in one of said pair of blocks on a row of storage positions selected by the corresponding one of said second or third circuit means and for simultaneously performing a read-write operation in the other one of said pair of blocks in a storage position selected by said first circuit means; timing means adapted to define periodic timing cycles; a reversible counter register corresponding to each of said pair of blocks adapted to provide an information signal representative of the difference between the number of elapsed cycles and the number of refresh operations carried out in each block during said elapsed cycles; and second control means for generating a first type of refresh interrupt signal when said information signal in at least one of said registers reaches a first predetermined value.

4,106,109

RANDOM ACCESS MEMORY SYSTEM PROVIDING HIGH-SPEED DIGITAL DATA OUTPUT

Charles J. Fassbender, Plano, Tex., assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 1, 1977, Ser. No. 764,603
Int. Cl.[2] G11C *8/02, 7/00*
U.S. Cl. 365—238 **6 Claims**



1. A random access memory for digital data comprising:

a data input line;

a memory matrix for storing digital data at addressable locations;

first address means for addressing a selected location of said memory matrix for directing data from said data input line to said selected location;

second address means for addressing said memory matrix to access data stored at a plurality of selected locations in said memory matrix;

output register means operatively connected to said memory matrix for simultaneously receiving and addressably storing the data addressed by said second address means; and

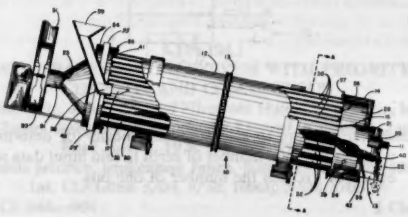
an output multiplexer means responsive to said first address means and operatively connecting a data output terminal to an addressed storage location of said output register means in response to the address dictated by said first address means and an enabling signal.

4,106,110

APPARATUS AND METHOD FOR PRODUCING ASPHALT-AGGREGATE COMPOSITIONS

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Continuation of Ser. No. 487,928, Jul. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 286,613, Sep. 5, 1972, abandoned. This application Aug. 19, 1976, Ser. No. 715,870
Int. Cl.[2] B28C *5/20*
U.S. Cl. 366—2 **9 Claims**



1. A method of treating an asphalt-aggregate composition comprising the steps:

introducing a composition comprising aggregate and asphalt into an input end of a mixing chamber;

mixing and gradually increasing the temperature of the composition without exposure to flame or hot gases of combustion by continuously passing it between a plurality of heated pipes while drawing the composition toward the opposite end of said mixing chamber; and

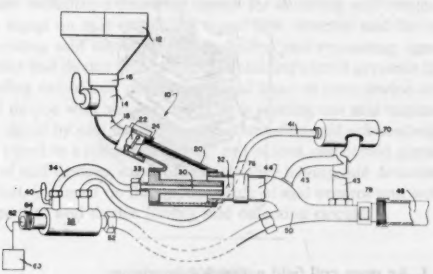
withdrawing volatile hydrocarbon gaseous mixture given off by the heated composition at the output end of the mixing chamber into a heating chamber into which a flame is introduced and directing the hot gases into the pipes.

4,106,111

CONCRETE MAKING AND TRANSMISSION

Leo J. Rose, Reston, Va. 22091

Filed Apr. 7, 1977, Ser. No. 785,716
Int. Cl.[2] B28C *5/38*
U.S. Cl. 366—3 **8 Claims**



1. Concrete making and transmission apparatus comprising a chamber, a hopper for receiving a blend of cement mix, water and aggregate in an amount to produce a setting of the cement, conduit means for conveying the blend of cement from the hopper to said chamber, a nozzle, a transmission conduit coupling said nozzle to said chamber, said chamber having a Venturi means having an orifice and centrally extending within said chamber with its orifice disposed at a location for exiting of the blend of cement from said chamber to said transmission conduit leading to said nozzle, an air compressor means, an air pump means for receiving air from said air compressor means, said air pump having first conveyance means connected thereto for feeding air to said Venturi

means for the admixture of air and said blend of cement, a second conveyance means connected to said air pump for feeding air to said transmission conduit leading to the nozzle for pushing and aiding the conveyance of the admixture of air and said blend of cement along the transmission conduit leading to the nozzle, a vibrator element for mechanically vibrating the transmission conduit leading to the nozzle, and a third conveyance means connected to said air pump for feeding air from said air pump for driving said vibrator element.

8. Improved method of making and transmitting concrete comprising receiving a blend of cement mix, water and aggregate in an amount to produce a setting of the cement, conveying the blend of cement to a chamber, said chamber having a Venturi means having an orifice and centrally extending within said chamber with its orifice disposed at a location for exiting of the blend of cement from said chamber to a transmission conduit leading to a nozzle, pumping compressed air by means of an air pump and a first conveyance means connected to said air pump to said Venturi means for the admixture of air and said blend of cement, passing the admixture to said transmission conduit, pumping compressed air by means of said air pump and a second conveyance means connected to said air pump to said transmission conduit for pushing and aiding the conveyance of the admixture of air and said blend of cement along said transmission conduit leading to the nozzle, and pumping compressed air by means of said air pump and a third conveyance means connected to said air pump to a vibrator element connected to said transmission conduit for driving said vibrator element to mechanically vibrate said transmission conduit.

4,106,112

HANDLING AND COOLING FOUNDRY SAND

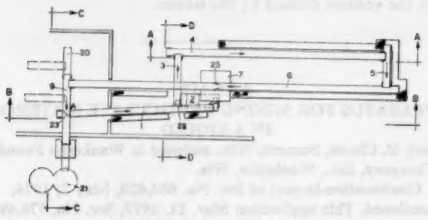
Leonard Leslie Jones, Aldridge, England, assignor to Mechandex Engineering (Wolverhampton) Ltd., Wolverhampton, West Midlands, England

Filed May 9, 1977, Ser. No. 795,281

Claims priority, application United Kingdom, May 14, 1976, 198 95/76

Int. Cl.[2] B22C *5/16*

U.S. Cl. 366—4 **8 Claims**



1. A process for cooling and handling sand comprising the steps of: mixing hot used sand with cool sand for cooling the hot used sand; circulating the mixed sand on conveyor means for cooling the mixed sand; and separating the mixed sand cooled on the conveyor means to provide a first cool sand fraction for discharce to successive milling and moulding stages, and a second cool sand fraction for said mixing with hot used sand.

4,106,113

FEEDING SCREW ASSEMBLY OF A MOLDING MACHINE FOR PLASTICIZING MASSES, PARTICULARLY, FOR PLASTICS OR RUBBER

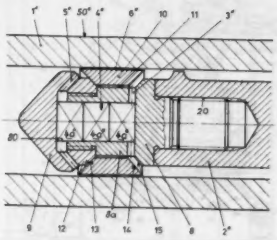
Friedrich Laimer, Reichenburg, and Bernhard Roth, Mollis, both of Switzerland, assignors to Netstal-Maschinen AG, Switzerland

Filed Nov. 4, 1976, Ser. No. 739,003

Claims priority, application Switzerland, Nov. 5, 1975, 14336/75

Int. Cl.[2] A21C *1/06*; B29B *1/10*; B29H *1/10*

U.S. Cl. 366—79 **5 Claims**



1. In a plasticizer comprising a cylinder having a bore the improvement comprising a feed screw adapted to be rotatably supported within this bore, said feed screw having a forward end with a passage portion, an annular non-return locking ring disposed around said passage portion and defining a ceiling gap clearance therebetween, said screw having a cap portion disposed ahead of said passage portion, a bore extending through said passage portion defining a mixing passage for the material being fed, means in said mixing passage for causing the diversion and intermixing of the material passing therethrough, said screw having a continuous thread on its periphery for advancing material through the bore of the cylinder upon rotation of said screw, a first feed passage defined in said screw at the juncture of said cap portion and said locking ring, and a second feed passage defined alongside the opposite end of said locking ring and extending radially inwardly from the periphery of said screw to said mixing passage, said locking ring being slideable after initial feeding by said screw rotation to at least partially close off one of said first and second feed passages.

4,106,114

INCLINED CONICAL ROTARY VESSELS FOR STORAGE AND TUMBLING OF MATERIALS TO ACCOMPLISH MIXING AND HEAT TRANSFER

James E. Moore, 1401 Meadow La., Glenview, Ill. 60025

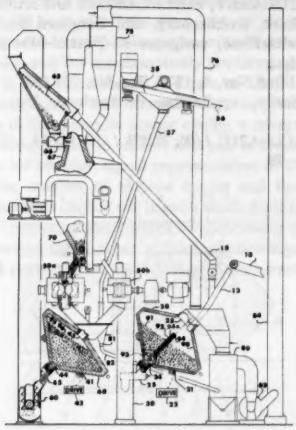
Filed Apr. 18, 1977, Ser. No. 788,638

Int. Cl.[2] B01F *15/02, 15/06, 9/02*

U.S. Cl. 366—131 **23 Claims**

1. In a tumbler assembly for mixing, storing and feeding particulate materials and for transferring heat between different materials, the combination comprising a tumbler having a lower portion in the form of a hollow inverter lower cone enclosed by a circular cover, the cover having an axial inlet and the cone having an axial outlet, means for orienting the tumbler with its axis inclined at an angle of 30° to 75° with respect to the horizontal, the included angle of the cone lying within the range of 80° to 135°, means for supporting the tumbler for rotation about its axis, driving means for rotating the tumbler at a speed lying within the range of a fraction of a revolution per minute up to several revolutions per minute, and means at the outlet for controlling the rate of flow so that a body of material is maintained in the tumbler with mixing thereof by cascading of material added at the inlet across the surface of the body and with the body of materials being continually mixed as the individual particles traverse the body along a multiplicity of paths by intermittent movements at

constantly changing rates and in constantly changing directions, generally from the inlet toward the outlet, as the paths



precess orbitally through the mass by reason of the conical shape, inclined axis and rotation of the tumbler.

4,106,115

MIXING APPARATUS

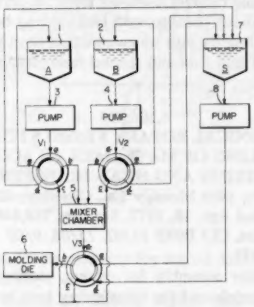
Akio Takahashi, Yokohama, and Hirokichi Saito, Shimizu, both of Japan, assignors to Ihara Chemical Industry Co. Ltd., Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,933

Claims priority, application Japan, Feb. 20, 1976, 51/16923; Aug. 5, 1976, 51/92794

Int. Cl.² B01F *15/02, 15/04*

U.S. Cl. 366—138 **6 Claims**



1. A material mixing apparatus comprising at least two tanks (1, 2; 41, 42) for starting materials, a corresponding number of material switching means (V1, V2; V41, V42) respectively connected with said tanks through pumps (3, 4; 43, 44), a mixer chamber (5; 45) connected to outlets (*b*) of said switching means, additional switching means (V3; V43) connected to an outlet of said mixer chamber, and a tank (7; 47) for feeding a liquid rinsing agent through a pump (8; 48) to an inlet of at least one (V3, F43) of said switching means; wherein said switching and said additional switching means each include a valve body (9) provided with five openings (*a . . . e*) and a switching element (10) for switchably maintaining two neighboring pairs of said openings in a mutually communicating relationship in each pair, while closing the remaining fifth opening.

4,106,116

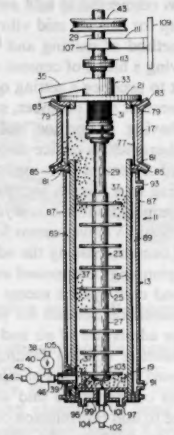
DISPERSING APPARATUS

Malcolm H. MacKay, 140 French Lea Rd., West Seneca, N.Y. 14224

Filed Jan. 7, 1977, Ser. No. 757,737

Int. Cl.² B01F *7/26, 15/02*

U.S. Cl. 366—144 **22 Claims**



1. An apparatus for continuously dispersing a particulate solid material in a liquid vehicle by means of a dispersing media which comprises a vessel having an inlet for a mixture of such particulate material and the liquid vehicle in which it is to be dispersed and an outlet for such particulate material dispersed in the liquid vehicle, an agitator for agitating the particulate material, the liquid vehicle therefor and the media to break up any agglomerates of the particulate material and to disperse such material in the liquid vehicle, said agitator including a rotatable shaft, a stationary screen in the vessel at an inner location at an end thereof and defining a volume, through which screen and into which volume the dispersion of particulate material in liquid vehicle therefor passes to exit from the vessel through the outlet thereof and through which the media cannot pass, said screen being located about the shaft, and a bearing in the vessel and upstream of the screen for holding the shaft in position while permitting the rotation thereof, said bearing having moving and stationary surfaces and a clearance, space between them which is small enough to prevent the media from entering into such clearance space, said clearance space communicating the vessel interior upstream of the screen with the volume defined by the screen.

4,106,117

APPARATUS FOR MIXING PARTICULATE MATERIAL IN A LIQUID

Henry R. Cloots, Summit, Wis., assignor to Waukesha Foundry Company, Inc., Waukesha, Wis.

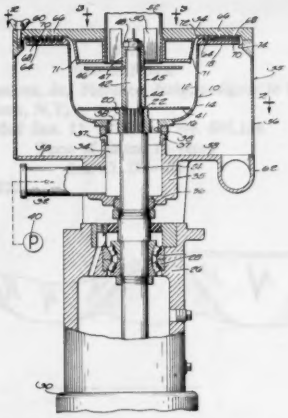
Continuation-in-part of Ser. No. 684,423, May 7, 1976, abandoned. This application Mar. 11, 1977, Ser. No. 776,696

Int. Cl.² B01F *9/18, 15/02*

U.S. Cl. 366—154 **16 Claims**

1. Apparatus for mixing liquid and particulate matter comprising a mixing bowl having a vertical axis, means for rotating said bowl about its axis at a speed sufficient to cause a liquid therein to be moved by centrifugal force up the inner surface of the bowl to the rim thereof, means for introducing a liquid into said bowl at a rate that permits an unbroken film of liquid to form on the inner surface of the bowl, means for introducing

particulate material in a path having a component of radial motion into said film of liquid and above the place where said



liquid enters said bowl, and means for collecting the mixed liquid and particulate material at the rim of said bowl.

4,106,118

FOOD PROCESSING APPARATUS

Richard D. Hoover, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jun. 6, 1977, Ser. No. 803,456

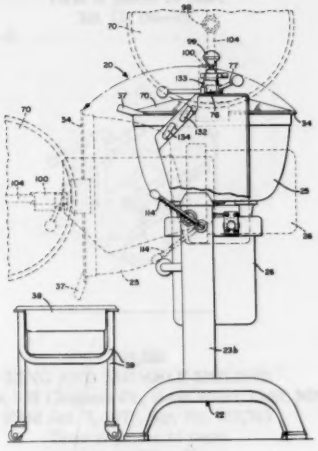
Int. Cl.[2] B01F *7/16*

U.S. Cl. 366—185 **4 Claims**

1. A raised height pouring system for an apparatus for processing foodstuffs, the apparatus including a mixing bowl having a drive shaft extending into the bowl through the bottom thereof, a motor mounted outside the bowl and connected to rotate the drive shaft, food processing blades mountable on the drive shaft within the bowl for processing foodstuffs therein when the motor is operated, and a cover system including a lid for closing the top of the bowl, comprising:

(a) a stand,

(b) pivot means supporting the bowl on the stand and defining an axis of rotation for the bowl for pivoting the bowl in a pouring direction from an upright, food processing position to a tilted pouring position, said axis being substantially horizontal and located between the center line



of the bowl and the edge of the bowl toward which it is tilted when rotated to the pouring position, to provide a greater pouring height than if the axis passed through the center line of the bowl, and

(c) a counterbalance spring assembly including means operative through said pivot means between said stand and the bowl for counterbalancing the apparatus during tilting thereof.

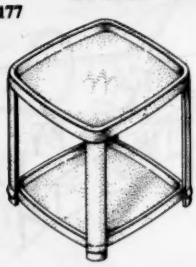
DESIGNS

AUGUST 8, 1978

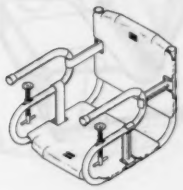
248,796
SHOE SOLE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed Jun. 11, 1976, Ser. No. 695,138
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—322

248,797
HOLSTER
Theodore Sanders, Newport Beach, Calif., assignor to Pacific Handy Cutter, Inc.
Filed Jul. 19, 1976, Ser. No. 706,767
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400

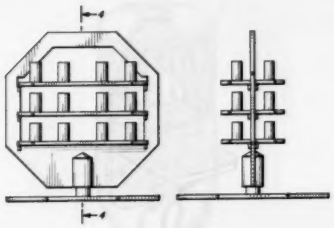
248,798
TABLE
James R. Driscoll, 404 Winston Ave., Dayton, Ohio 45403
Filed Sep. 9, 1976, Ser. No. 721,884
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



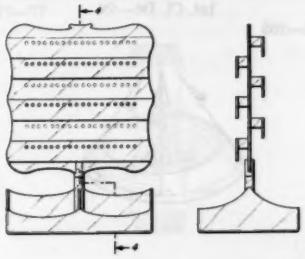
248,799
PORTABLE HIGH CHAIR
Donald Gilbert Adams, R.R. 1, Box 557, High Ridge, Mo. 63049
Filed Jul. 22, 1976, Ser. No. 707,609
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—9



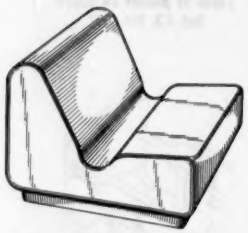
248,800
RING AND THIMBLE HOLDER
Eddie Tafoya, 518 Chapman Ct., Santa Clara, Calif. 90505
Filed Jan. 7, 1977, Ser. No. 757,743
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—24



248,801
COMBINED EARRING AND JEWELRY HOLDER
Eddie Tafoya, 518 Chapman Ct., Santa Clara, Calif. 90505
Filed Jan. 21, 1977, Ser. No. 761,548
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—25

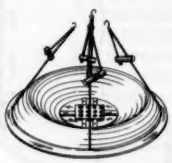


248,802
ADULT'S CHAIR
R. Duane Iselin, Flourtown, Pa., assignor to Mobi Corporation, Philadelphia, Pa.
Filed Apr. 27, 1976, Ser. No. 680,683
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66

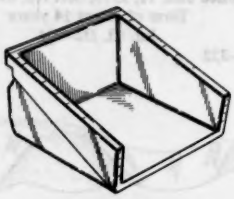


248,803
COMBINED SHELF AND TOWEL RINGS
Geral H. Newton, 3165 Aroba Way, San Jose, Calif. 95118
Filed May 4, 1977, Ser. No. 793,896
Term of patent 14 years
Int. Cl. D23—*02;* D6—*04*
U.S. Cl. D6—91

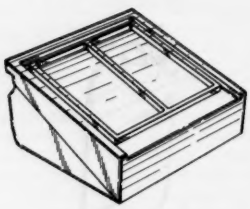
248,804
CUT TREE HOLDER
James M. Budd, 518 N. 7th St., Osage, Iowa 50461
Filed Apr. 7, 1976, Ser. No. 674,499
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—105



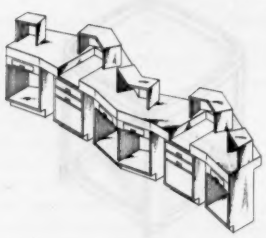
248,805
WALL MOUNTED MODULAR TRAY
John A. Bridges, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.
Filed Jan. 17, 1977, Ser. No. 760,089
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—136



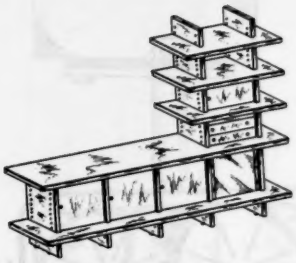
248,806
WALL MOUNTED MODULAR TRAY
John A. Bridges, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.
Filed Jan. 17, 1977, Ser. No. 760,091
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—136



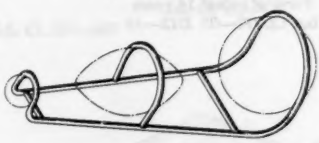
248,807
MULTIPLE STATION SERVICE COUNTER
Vernon C. Canfield, P.O. Box 7291, Rt. 7, Bainbridge Island, Wash. 98110, and Charles F. Anderson, 1265 Old Mill Rd., San Marino, Calif. 91108
Filed Aug. 30, 1976, Ser. No. 718,933
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157



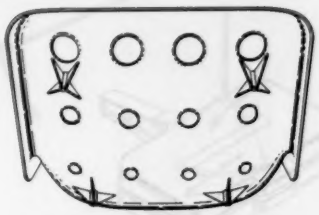
248,808
COMBINED SHELF AND CABINET UNIT
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti
Division of Ser. No. 595,406, Jul. 14, 1975. This application Oct. 26, 1976, Ser. No. 735,533
Claims priority, application Italy, Jan. 15, 1975, 60904/75; Jan. 15, 1975, 60905/75
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—169



248,809
DISPLAY RACK
John C. Kailey, 9261 Elben Pl., Sun Valley, Calif. 91352
Filed Aug. 9, 1976, Ser. No. 712,531
Term of patent 14 years
Int. Cl. D20—*02*; D6—*04*
U.S. Cl. D6—188



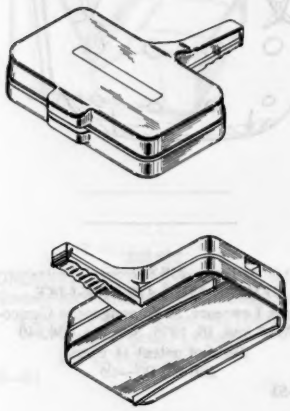
248,810
CHAIR SHELL
Ronald Henry Day, London, England, assignor to Hille International Limited, Watford, England
Filed Oct. 10, 1975, Ser. No. 621,345
Claims priority, application United Kingdom, Jun. 6, 1975, 971367/75
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197



248,811
PEPPER MILL OR THE LIKE
Walter Schlessel, Lawrence, N.Y., assignor to Gemco-Ware Inc.
Filed Aug. 15, 1975, Ser. No. 604,940
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—53

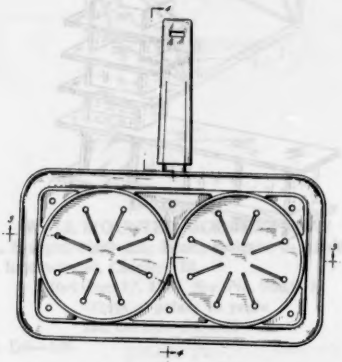
248,812
DOUBLE ENDED VACUUM BOTTLE
John H. Eiserman, 1616 16th St., Monroe, Wis. 53566
Filed Oct. 18, 1976, Ser. No. 733,457
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—77

248,813
HAMBURGER COOKER
Tetsuro Mizoguchi, Fort Lee, N.J., assignor to Sanyei Corporation, Tokyo, Japan
Filed Apr. 16, 1976, Ser. No. 677,568
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—88

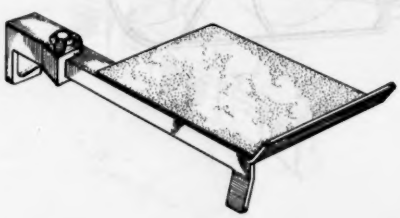


248,814
NUT CRACKER
Peter Kingsley Bayly, Eltham North, Australia, assignor to Wiltshire Cutlery Company Proprietary Ltd., South Melbourne, Australia
Filed Jul. 16, 1976, Ser. No. 705,902
Claims priority, application Australia, Feb. 13, 1976, 68606
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—98

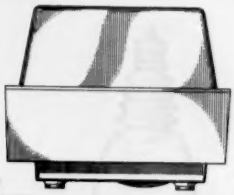
248,815
GRILL PLATE FOR A COOKING UTENSIL
Tetsuro Mizoguchi, Fort Lee, N.J., assignor to Sanyei Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 677,568, Apr. 16, 1976. This application Jul. 12, 1976, Ser. No. 704,418
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—129

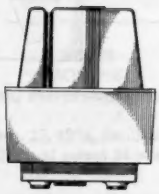


248,816
RETRACTABLE SHOE CLEANER
Victor K. Futami, 319 N. Vancouver Ave., Los Angeles, Calif. 90022
Filed Feb. 14, 1977, Ser. No. 768,374
Term of patent 14 years
Int. Cl. D7—*05;* D12—*16*
U.S. Cl. D7—182

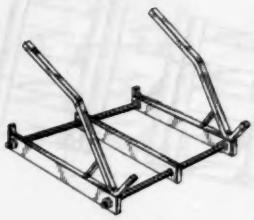


248,817
PHONOGRAPH RECORD CLEANER
Richard O. Spencer, 18 Viejo, Irvine, Calif. 92715
Filed Mar. 24, 1977, Ser. No. 781,030
Term of patent 14 years
Int. Cl. D7—*05;* D4—*01*
U.S. Cl. D7—161



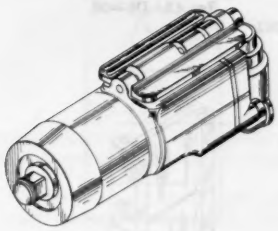


248,818
FIRE GRATE
Norman F. Dacey, Box 545, Port Hope, Ontario, Canada (L1A 3Z4)
Filed Apr. 22, 1977, Ser. No. 790,067
Claims priority, application Canada, Apr. 15, 1977, 15-04-77-4
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—207

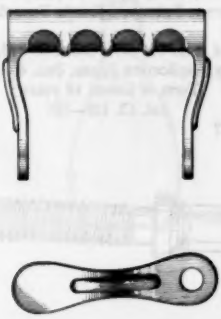


248,819
CONTOUR HOE
Kenneth H. Hare, 4938 Sharp St., Dallas, Tex. 75247
Filed May 3, 1976, Ser. No. 682,498
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—11

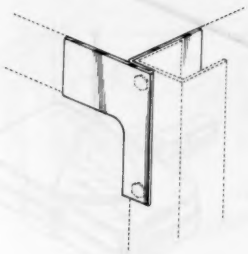
248,820
IMPACT WRENCH
Robert D. Roth, Utica, and Raymond J. Schaedler, Hartford, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.
Filed Feb. 17, 1977, Ser. No. 769,708
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—61



248,821
HANDLE FOR A POWER TOOL OR SIMILAR ARTICLE
H. Gerald Poe, Fort Worth, Tex., assignor to F & B Manufacturing, Inc., Odessa, Tex.
Filed Oct. 12, 1976, Ser. No. 731,562
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—107

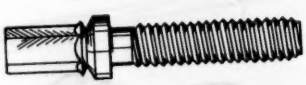


248,822
REINFORCEMENT BRACKET
Genshi Taniwaki, Kumamoto, Japan, assignor to Kongo Co., Ltd., Kumamoto, Japan
Filed Mar. 25, 1977, Ser. No. 781,494
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354

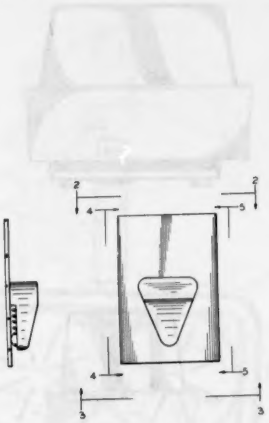


248,823
ROOM DIVIDER CONNECTOR OR SIMILAR DEVICE
Austin Eckerline, Ladysmith, Wis., assignor to Conwed Corporation, St. Paul, Minn.
Filed Jul. 16, 1976, Ser. No. 706,006
Term of patent 14 years
Int. Cl.[2] D8—*08*
U.S. Cl. D8—382

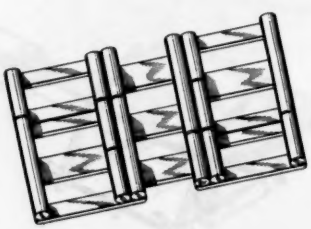
248,824
BOLT
Yoshio Imai, Abiko, and Katsumi Koizumi, Koshigaya, both of Japan, assignors to Kabushiki Kaisha Sannohashi Seisakusho, Japan
Filed Aug. 11, 1976, Ser. No. 713,600
Claims priority, application Japan, Jun. 4, 1976, 51-20773
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—387



248,825
MESSAGE HOLDER
Wilbert W. Redmer, 71 Northeast 11th Way, Deerfield Beach, Fla. 33441
Filed Apr. 30, 1976, Ser. No. 681,800
Term of patent 14 years
Int. Cl. 19—*02;* 14—*99*
U.S. Cl. D8—395



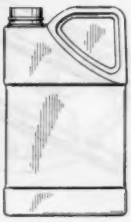
248,826
LINK UNIT FOR A CONVEYOR CHAIN
Erkki Topias Lehtola, Kaskinen, Finland, assignor to Oy Tähkä AB, Finland
Filed Jun. 9, 1976, Ser. No. 694,297
Claims priority, application Finland, Dec. 9, 1975, 653/75
Term of patent 14 years
Int. Cl. D8—*99;* D12—*05*
U.S. Cl. D8—499



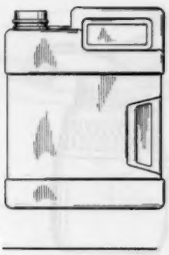
248,827
COMBINED BOTTLE AND BREAKAWAY CLOSURE
Willfred Goldschmidt, Weston, and Wiley Alan Kittrell, Greenwich, both of Conn., assignors to Beecham, Inc., Clifton, N.J.
Filed Nov. 26, 1976, Ser. No. 745,195
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—2

248,828
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc.
Filed Dec. 27, 1976, Ser. No. 754,781
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—42

248,829
JUG
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Oct. 8, 1976, Ser. No. 730,902
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—44

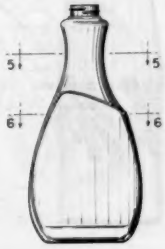


248,830
JUG
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Oct. 8, 1976, Ser. No. 730,903
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—52

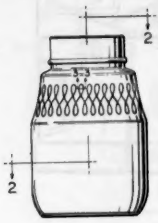


248,831
JUG
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Oct. 8, 1976, Ser. No. 731,054
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—52

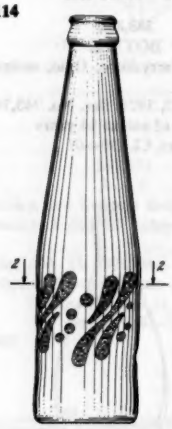
248,832
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc.
Filed Nov. 22, 1976, Ser. No. 743,742
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60



248,833
BOTTLE
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Mar. 22, 1976, Ser. No. 669,140
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—101



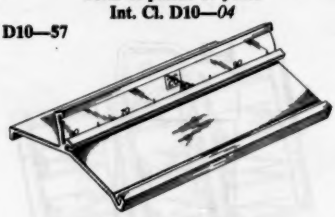
248,834
BOTTLE
Fred Ferdinand Morgan, Blonay, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Switzerland
Filed Sep. 2, 1975, Ser. No. 609,575
Claims priority, application Switzerland, Mar. 5, 1975, 60596/75
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—114



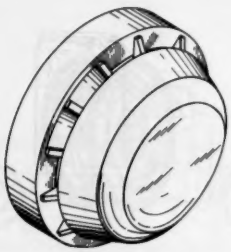
248,835
BOTTLE OR THE LIKE
Fred B. Korsmeyer, Madison, Conn., assignor to FBK Industries, Inc., New Haven, Conn.
Filed Oct. 6, 1976, Ser. No. 730,268
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—159

248,836
BOTTLE
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Oct. 8, 1976, Ser. No. 730,923
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—167

248,837
DESK THERMOMETER
James E. Hutten, Mason, Ohio, assignor to American Thermometer Co., Inc., Dayton, Ohio
Filed Sep. 22, 1976, Ser. No. 725,658
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57



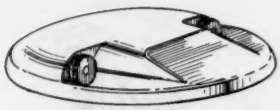
248,838
ROUND THERMOSTAT GUARD
Ralph E. Pasquarette, Jordan, and Norbert Thomas Wolfe, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Jun. 9, 1976, Ser. No. 694,513
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—60



248,839
END CAP FOR A THERMOMETER PROBE COVER
Robert B. Turner, Weymouth, Mass., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Sep. 16, 1976, Ser. No. 723,854
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—60

248,840
BUOY
Harold Aesch, Sr., 626 W. Oak Ridge Rd.; Harold Aesch, Jr., 820 E. Buchanon Ave., both of Orlando, Fla. 32809, and Darrell N. Welch, 3305 Arnel Ct., Winter Park, Fla. 32789, assignors to Harold W. Aesch, Sr.; Harold W. Aesch, Jr.; Darrell N. Welch; Asis K. Saha and John B. Pollet, part interest to each
Filed Jun. 11, 1976, Ser. No. 695,208
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—107

248,841
REFLECTIVE PAVEMENT MARKER
Joseph W. Montigny, 2441 Merced, South El Monte, Calif. 91733
Filed Jun. 9, 1976, Ser. No. 694,298
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—113

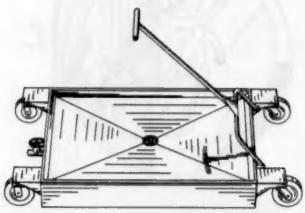


248,842
SPREADING TREE PLAQUE
Donald R. Ditto, 4938 Sharp St., Dallas, Tex. 75247
Filed May 24, 1976, Ser. No. 689,140
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—118

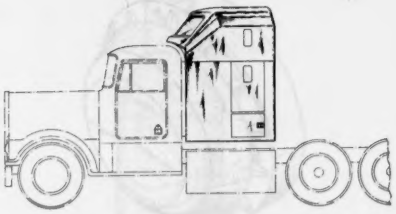
248,843
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,520
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—127

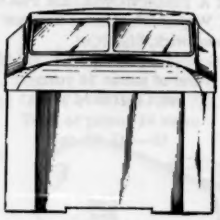
248,844
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Mar. 1, 1976, Ser. No. 662,621
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—128

248,845
MOBILE DRAIN PAN FOR LIQUID STORAGE AND RECOVERY
Robert E. White, 3717 S. Taft Hill Rd. # 252, and Brice E. Bergquist, 5416 S. County Rd. # 7, both of Fort Collins, Colo. 80521
Filed Jan. 28, 1977, Ser. No. 763,237
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—25

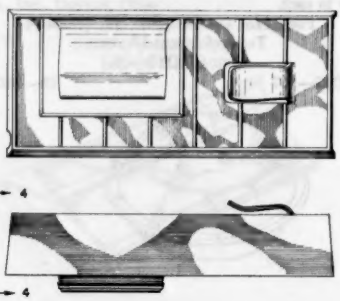


248,846
TRUCK SLEEPER COMPARTMENT
James C. Stage, Seattle; Albert B. Bliven, Renton, and James E. Wohlhueter, Auburn, all of Wash., assignors to PACCAR Inc., Bellevue, Wash.
Filed Oct. 27, 1976, Ser. No. 736,214
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

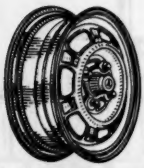




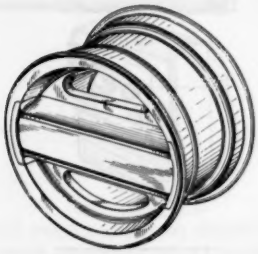
248,847
AUTOMOBILE VISOR ATTACHMENT
Dwight N. Wooters, LaGrange, Ga., assignor to Rubbermaid Specialty Products Inc., LaGrange, Ga.
Filed Mar. 23, 1977, Ser. No. 780,659
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—191



248,848
WHEEL
Hirotsune Taitani, Seto, and Yoshihiro Hamasaki, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Jun. 29, 1977, Ser. No. 811,366
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209



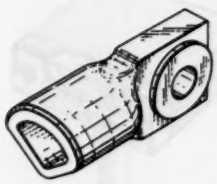
248,849
WHEEL
Edward A. Kozloski, Babylon, N.Y., assignor to Fiat Motors of North America, Montvale, N.J.
Division of Ser. No. 719,721, Sep. 2, 1976, Pat. No. Des. 246,239. This application Jul. 18, 1977, Ser. No. 816,283
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209



248,850
ELECTRIC FENCE EXTENDER FOR WOODEN POSTS
Albert T. Berg, Jr., and Howard Langlie, both of Ellendale, Minn. 56026
Filed Apr. 25, 1977, Ser. No. 790,563
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—17

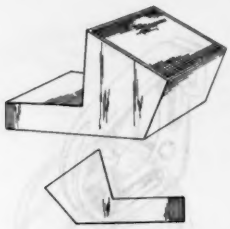
248,851
CORNER INSULATOR FOR ELECTRIC FENCES
Howard Langlie, and Albert T. Berg, Jr., both of Ellendale, Minn. 56026
Filed Jul. 29, 1976, Ser. No. 709,884
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—18

248,852
ELECTRICAL TERMINAL
John Iceton, Ewell Rd., Surbiton, Surrey, England
Filed Jan. 22, 1976, Ser. No. 651,658
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

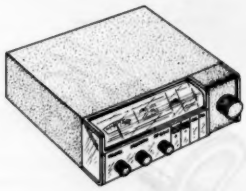


248,853
TRANSCRIBER
David K. Walz, Stone Mountain, Ga., and Toshihiko Kadota, Hachioji, Japan, assignors to Lanier Business Products, a Division of Oxford Industries Inc., Atlanta, Ga. and Olympus Optical Company Ltd., Tokyo, Japan
Filed Apr. 5, 1976, Ser. No. 673,749
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—3

248,854
SPEAKER ENCLOSURE
Warren Ripple, 2839 Sterling La., Sarasota, Fla. 33581
Division of Ser. No. 550,089, Feb. 14, 1975, Pat. No. Des. 244,696. This application Jul. 6, 1976, Ser. No. 714,935
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—30

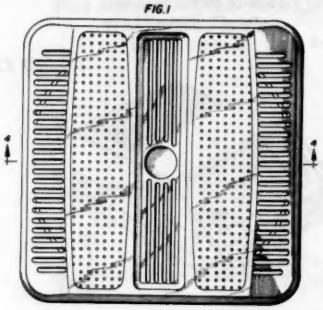


248,855
C. B. RADIO
James T. Asaki, Fair Haven, N.J., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.
Filed Aug. 17, 1976, Ser. No. 715,345
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—75

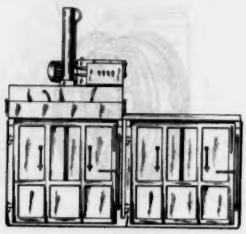


248,856
SPEAKER GRILL
Jack R. Saidel, 1618 Heather-Hill Crescent, Flossmoor, Ill. 60422
Filed Oct. 22, 1976, Ser. No. 734,714
Term of patent 7 years
Int. Cl. D14—*01, 99*
U.S. Cl. D14—39

FIG. 1

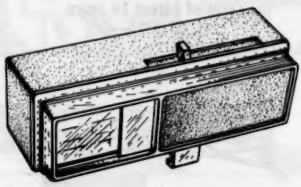


248,857
PAPER PRESS FOR WASTE
Bengt Andersson, Gyllensvardsgatan 11, S-302 34 Halmstad, Sweden
Filed Aug. 16, 1976, Ser. No. 714,888
Claims priority, application Sweden, Feb. 16, 1976, 760355
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—123

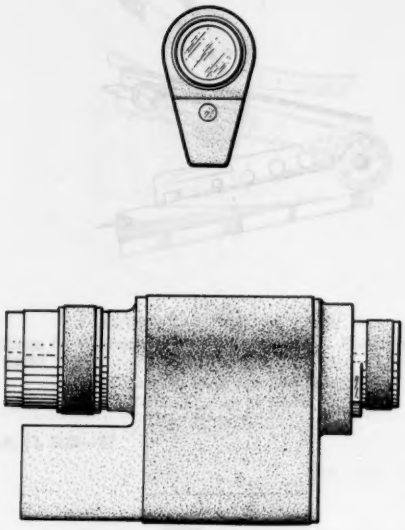


248,858
CAMERA
Hiroshi Fukuda, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Jan. 21, 1977, Ser. No. 761,035
Claims priority, application Japan, Jul. 20, 1976, 51-28259
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—06

248,859
PHOTOFLASH ATTACHMENT FOR CAMERAS
James T. Asaki, Fair Haven, N.J., assignor to International Telephone & Telegraph Corporation
Filed Jul. 21, 1976, Ser. No. 707,162
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42



248,860
NIGHT VISION POCKETSCOPE
Douglas M. Spranger, Brooklyn; Malcolm J. Brookes, and Peter O. Schmidt, both of New York, all of N.Y., assignors to International Telephone & Telegraph Corporation, Nutley, N.J.
Filed Mar. 11, 1976, Ser. No. 665,984
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—62

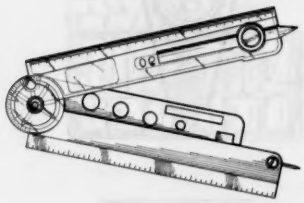


248,861
SPECTACLES FRAME FRONT
David W. Johnsen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Mar. 21, 1977, Ser. No. 779,449
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

248,862
COMBINED MECHANICAL PENCIL AND POINTER
Naoyoshi Miyamoto, 12-23, 3-chome, Isobe, Annaka-shi, Gunma-ken, Japan
Filed Jun. 9, 1976, Ser. No. 694,226
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—36

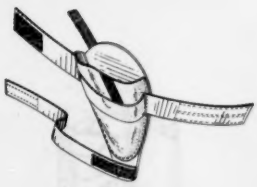
248,863
COMBINED BALL POINT PEN AND POINTER
Naoyoshi Miyamoto, 12-23, 3-chome, Isobe, Annaka-shi, Gunma-ken, Japan
Filed Jun. 9, 1976, Ser. No. 694,227
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—36

248,864
COMBINED MEASURING AND DRAWING INSTRUMENT
Watson Yen, 1525 N. Hayworth Ave., Apt. 301, Los Angeles, Calif. 90046
Filed Sep. 10, 1976, Ser. No. 722,239
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—36



248,865
MARKING PEN
Philip Sussman, Orlando, and Francis Andrews, Apopka, both of Fla., assignors to Mark-Tex Corporation, Englewood, N.J.
Filed Mar. 16, 1977, Ser. No. 778,055
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—43

248,866
LEG HOLSTER
Rafael L. Gonzales, 919 San Francisco, San Antonio, Tex. 78201
Filed Sep. 17, 1976, Ser. No. 724,165
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13



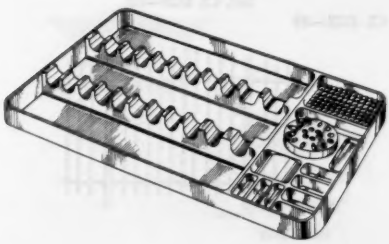
248,867
ARTIFICIAL FISHING LURE
William O. Williams, Jr., 1309 Lynhurst Dr., Gastonia, N.C. 28052
Filed Nov. 24, 1976, Ser. No. 744,625
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

248,868
ARTIFICIAL FISHING LURE
William O. Williams, Jr., 1309 Lynhurst Dr., Gastonia, N.C. 28052
Filed Dec. 2, 1976, Ser. No. 746,784
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

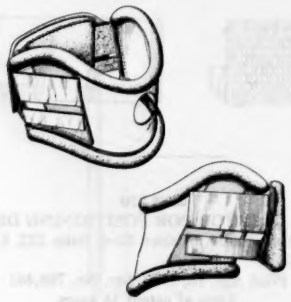
248,869
AIR PURIFIER
Charles J. Risher, 3641 Pillsbury, Minneapolis, Minn. 55402
Filed Jan. 14, 1977, Ser. No. 759,372
Term of patent 7 years
Int. Cl. D23—*04*
U.S. Cl. D23—149

248,870
DENTAL LOCATOR FOR POSITIONING DENTURE
Martin A. Hass, 11704 Wilshire Blvd. Suite 222, Los Angeles, Calif. 90025
Filed Apr. 18, 1977, Ser. No. 788,441
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10

248,871
SURGICAL INSTRUMENT TRAY
Tore Alexander Forsman, Sveavägen, and Christer Odvik, Djursholm, both of Sweden, assignors to Toringe Consult AB, Saltsjöbaden and Christer Odvik AB, Djursholm, both of, Sweden
Filed Apr. 6, 1976, Ser. No. 674,272
Claims priority, application Sweden, Oct. 7, 1975, 7500201
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—31



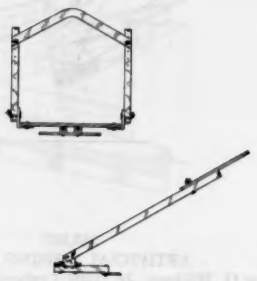
248,872
CERVICAL COLLAR
Morton I. Thomas, 101 Gedney St., Nyack, N.Y. 10960
Filed Nov. 17, 1976, Ser. No. 742,487
Term of patent 14 years
Int. Cl. D24—*04;* D2—*01*
U.S. Cl. D24—64



248,873
BLOOD GAS SYRINGE STOPPER
Russell G. Raitto, Fitzwilliam, N.H., assignor to Concord Laboratories, Keene, N.H.
Filed Jul. 1, 1976, Ser. No. 701,609
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—99

248,874
COMBINED FENCE AND GATE
Dan Prause, Rte. #2, Box 159, Alleyton, Tex. 78935
Filed Apr. 5, 1977, Ser. No. 784,922
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—39

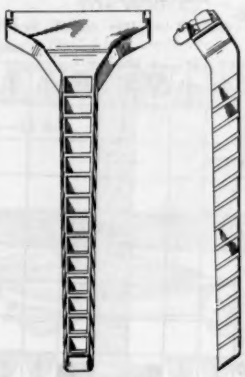
248,875
TREE CLIMBER AND SEAT OR THE LIKE
Alvin E. Warren, 1115 Lane Ave., North, Jacksonville, Fla. 32205, and George B. Sweat, 4121 Aldington Dr., Jacksonville, Fla. 32210
Filed Dec. 10, 1976, Ser. No. 749,459
Term of patent 14 years
Int. Cl.[2] D25—*99*
U.S. Cl. D25—62



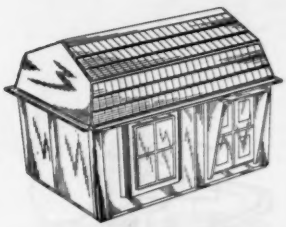
248,876
ASHTRAY
Åke Albin Hultberg, Box 57, S-150 30 Mariefred, Sweden
Filed Nov. 22, 1976, Ser. No. 743,714
Claims priority, application Sweden, Aug. 4, 1976, 761541
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—27

248,877
LIGHTER
Anthony Roberts Harris, Hanworth, England, assignor to Dunhill Lighters Limited, London, England
Filed Apr. 4, 1975, Ser. No. 565,264
Claims priority, application United Kingdom, Oct. 22, 1974, 968366/74
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

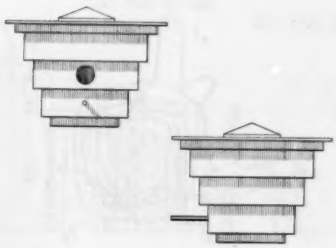
248,878
RAZOR
Hans Halm, Castroper Strasse 34, 4650 Herne 1, Fed. Rep. of Germany
Filed Sep. 7, 1976, Ser. No. 720,845
Claims priority, application United Kingdom, Mar. 10, 1976, 974850/76
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46



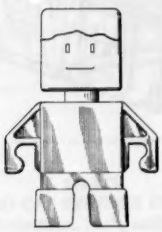
248,879
PET HOUSE
David E. Hill, Gardner, Kans. 66030
Filed Aug. 6, 1976, Ser. No. 757,647
Term of patent 14 years
Int. Cl. D30—*01*
U.S. Cl. D30—1



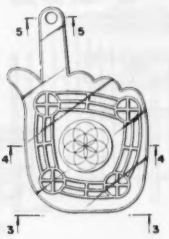
248,880
BIRDHOUSE
Walter H. Podjan, 1500 Rocky Gap, Benton Harbor, Mich. 49022
Filed Mar. 14, 1977, Ser. No. 776,831
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—3



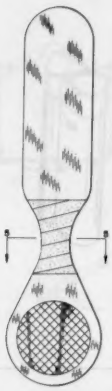
248,881
TOY FIGURE
Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91345; Erwin Benkoe, deceased, late of Encino, Calif. by Elizabeth Benkoe, executrix; Delmar K. Everitt, Woodland Hills, Calif.; Ronald F. Chesley, La Crescenta, Calif., and Richard D. Friedrich, Canoga Park, Calif., assignors to Adolph E. Goldfarb, Tarzana, Calif. and Elizabeth Benkoe, Encino, Calif., executrix of the estate of Erwin Benkoe
Filed Feb. 18, 1977, Ser. No. 770,221
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



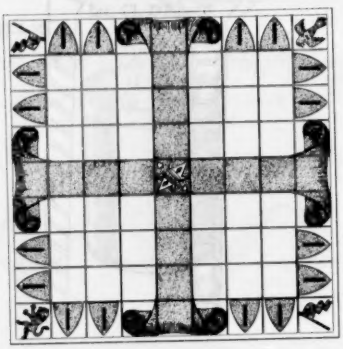
248,882
HAND POINTER FOR A GAME OR SIMILAR ARTICLE
Ziva Grushevsky Rosen, 100 W. 57th St., New York, N.Y. 10019, and Jacob Benjamin Burke, 6771 Yellowstone Blvd., Forest Hills, N.Y. 11375
Filed Mar. 8, 1976, Ser. No. 664,577
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 MM



248,883
COMBINED PADDLE AND BAT
Jack G. McAllister, 2701 N. Douglas Dr., Apt. 328, Minneapolis, Minn. 55422
Filed Jul. 26, 1976, Ser. No. 708,414
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SP



248,884
GAME BOARD
Theodore David Foxworthy, 520 W. 122nd St., New York, N.Y. 10027
Filed Sep. 27, 1976, Ser. No. 727,213
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

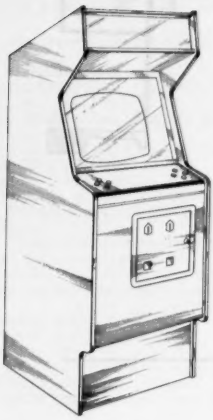


248,885

VIDEO GAME CABINET

Lonnie C. Pogue, San Diego, Calif., assignor to Gremlin Industries, Inc.

Filed Dec. 13, 1976, Ser. No. 749,787
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 L

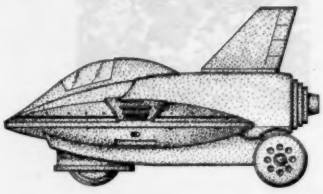


248,886

TOY VEHICLE

Yuji Kato, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Oct. 7, 1976, Ser. No. 730,684
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

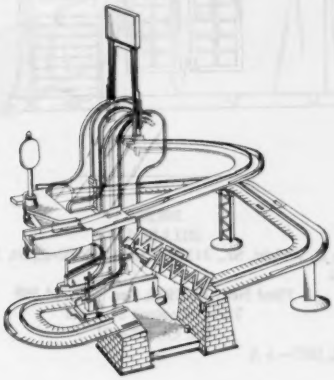


248,887

TOY TRACKWAY

Yutaka Tanaka, Saitama, Japan, assignor to Toytown Corporation, Tokyo, Japan

Filed Nov. 30, 1976, Ser. No. 746,171
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 K

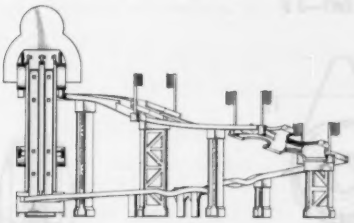


248,888

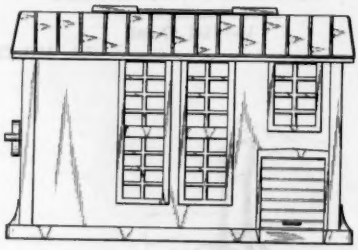
TOY VEHICLE TRACKWAY

Katsumi Sato, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

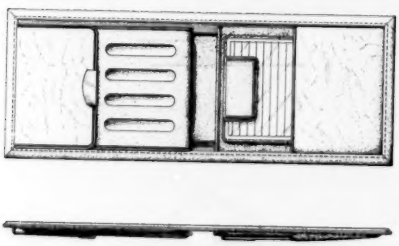
Filed Dec. 9, 1976, Ser. No. 748,812
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 K



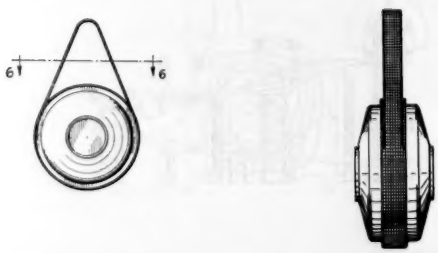
248,889
TOY BUILDING
Duane E. Spengler, West Falls, and Ralph W. Crawford, East Aurora, both of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 9, 1976, Ser. No. 749,004
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



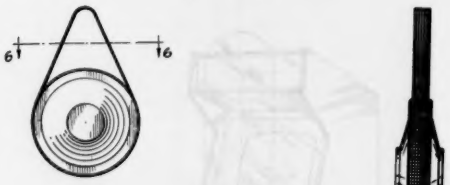
248,890
BILLFOLD
Charles B. Wright, Sr., 311 N. Lindbergh Blvd., St. Louis, Mo. 63141
Filed Nov. 23, 1976, Ser. No. 744,358
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 A



248,891
PURSE
Marilyn J. Pfleger, 5303 Clark Ave., Cleveland, Ohio 44102
Filed Jun. 1, 1976, Ser. No. 691,520
The portion of the term of this patent subsequent to Aug. 8, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F



248,892
PURSE
Marilyn J. Pfleger, 5303 Clark Ave., Cleveland, Ohio 44102
Filed Jun. 1, 1976, Ser. No. 691,382
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F



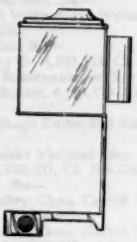
248,893
FABRIC
Leo John Comensoli, Dural, and Gloria Dawn Smythe, Potts Point, both of Australia, assignors to Speedo Knitting Mills Pty Ltd.
Filed Oct. 27, 1976, Ser. No. 736,043
Claims priority, application Australia, Apr. 27, 1976, 69071/76; Apr. 27, 1976, 69072/76
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 K

248,894

COMBINED MENU AND TRAY SUPPORT OR THE LIKE

Sidney A. Long, 7809 NW. 27th, Bethany, Okla. 73008

Filed Sep. 10, 1976, Ser. No. 722,014
Term of patent 14 years
Int. Cl. D6—*04;* D20—*03*
U.S. Cl. D96—12 R

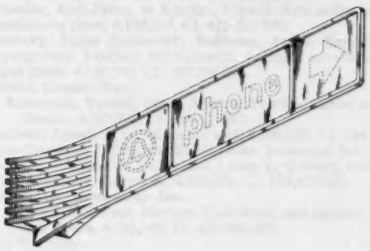


248,895

SURFACE MOUNT INDICIA DISPLAY APPARATUS

William G. Frick, 2240 White Oak Dr., Northbrook, Ill. 60062

Filed Jan. 4, 1977, Ser. No. 756,620
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



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TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Allied Chemical Corporation: *See*—
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Swaine, James W., Jr.; Low, William W.; and Bean, Samuel L., 4,105,754, Cl. 423-514.000.
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Anderson, Clarence E., to Texaco Exploration Canada Ltd. Abrasive resistant choke. 4,105,049, Cl. 138-44.000.
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Andrews, Bethlehem K.; Harper, Robert J., Jr.; and Cashion, Norton A., to United States of America, Agriculture. Knitted cotton fabric durably patterned by differential shrinkage. 4,105,403, Cl. 8-115.000.
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Aveneau, Andre A.; and Barbier, Xavier N., to Societe Anonyme de Telecommunications. Time-division multiplex digital transmission system with intermediate stations adapted to transit insert and extract digital channels. 4,105,869, Cl. 179-15.0BD.

Avery, James E.: *See—*
Yerkes, John W.; and Avery, James E., 4,105,471, Cl. 136-89.0CC.

Axthammer, Ludwig, to Fichtel & Sachs AG. Hydraulic system. 4,105,041, Cl. 137-116.000.

Ayata, Naoki: *See—*
Tanaka, Nobuyoshi; Ayata, Naoki; Takeda, Mitsuo; Matsumura, Susumu; and Matsumoto, Kazuya, 4,105,335, Cl. 356-108.000.

Ayers, Wayne R. Combination gauge. 4,104,909, Cl. 73-118.000.

Ayerst, McKenna & Harrison, Ltd.: *See—*
Philipp, Adolph H.; and Jirkovsky, Ivo L., 4,105,778, Cl. 424-275.000.

Azadian, Genevieve: *See—*
Pierdet, Andre; and Azadian, Genevieve, 4,105,761, Cl. 424-243.000.

Aztec Staging Co., Inc.: *See—*
Bardwick, John, III, 4,104,835, Cl. 52-7.000.

B. F. Goodrich Company, The: *See—*
Cohen, Louis, 4,105,840, Cl. 526-62.000.

B & H Manufacturing Company, Inc.: *See—*
Hoffmann, Wolfgang, 4,104,845, Cl. 53-14.000.

Baak, Albert E. Power unit for golf cart and the like. 4,105,084, Cl. 180-11.000.

Babcock & Wilcox Company, The: *See—*
Pinkstaff, Carlos Dean, 4,104,899, Cl. 72-24.000.

Bacher, Helmut. Broad-band continuously variable attenuator. 4,105,960, Cl. 333-81.00A.

Back, Gerhard, to Ciba-Geigy Corporation. Process for dyeing natural protein fibres with metallic azo dyes. 4,105,400, Cl. 8-43.000.

Bacovsky, Filip: *See—*
Jakl, Vladimir; Cink, Josef; and Bacovsky, Filip, 4,104,823, Cl. 47-1.00R.

Baghdady, Elie J. Navigation aid system. 4,106,023, Cl. 343-106.00D.

Bagli, Jehan F.; and Ferdinandi, Eckhardt, to American Home Products Corporation. Thiphene ethanolamines. 4,105,663, Cl. 544-379.000.

Baguelin, Yves, to Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques Saviem. Engine cooling systems. 4,104,993, Cl. 123-41.490.

Baird, William C., Jr.: *See—*
Say, Geoffrey R.; and Baird, William C., Jr., 4,105,704, Cl. 260-666.00P.

Baker, Alfred. Side glare-eliminating device for securement to eyeglasses and other suitable mounting structures. 4,105,304, Cl. 351-47.000.

Baker, Derrick John; and Bones, Roger John. Electric cells. 4,105,834, Cl. 429-104.000.

Baker, Eugene E., to Halliburton Company. Gravel pack liner assembly and selective opening sleeve positioner assembly for use therewith. 4,105,069, Cl. 166-51.000.

Baker International Corporation: *See—*
Helmus, Sydney S., 4,105,075, Cl. 166-321.000.

Baker, Richard Anson; Forsythe, George Daniel; Likhyani, Kewal Krishan; Roberts, Robert Earl; and Robertson, David Charles, to Du Pont de Nemours, E. I., and Company. Separation device of rigid porous inorganic hollow filament and use thereof. 4,105,548, Cl. 210-23.00H.

Baker, Robert W.: *See—*
Wasson, Joe R.; Pressley, Joseph R.; Baker, Robert W.; Fairaizl, Joseph H.; and Zorker, Richard J., 4,105,328, Cl. 355-78.000.

Balatan, Sergio E., to M&T Chemicals Inc. Interpolymers, method of preparing the same and emulsions thereof, and metal cans coated with the interpolymers. 4,105,615, Cl. 260-29.60T.

Balco, Inc.: *See—*
Balzer, Claude P.; and Corman, Edward M., 4,104,839, Cl. 52-288.000.

Balda-Werke Photographische Gerate Und Kunststoff GmbH & Co., KG.: *See—*
Lange, Karl Heinz, 4,106,041, Cl. 354-206.000.

Balducci, Agostino; Corbellini, Margherita; Mormino, Vittorio; Notari, Bruno; and Rivola, Luigi, to Snam Progetti, S.p.A. Preparation of copper and silver particles for ethylene purification. 4,105,588, Cl. 252-454.000.

Ball, Edmund Hugh, to Pirelli General Cable Works Ltd. Electrical cable installations with cooling means. 4,105,860, Cl. 174-15.00C.

Ball Valve Company, Inc.: *See—*
Bunn, Stuart E.; and Owsley, Herbert B., 4,105,058, Cl. 151-41.740.

Ballas, George C., to Weed Eater, Inc. Rotary cutting assembly. 4,104,797, Cl. 30-276.000.

Balzer, Claude P.; and Corman, Edward M., to Balco, Inc. Wall protection assembly. 4,104,839, Cl. 52-288.000.

Banks, Reginald George Sinclair; and Williams, Alan, to British Gas Corporation. Method of preparing and filtering coprecipitated nickel-alumina catalysts. 4,105,591, Cl. 252-466.00J.

Barber-Colman Company: *See—*
Trost, Wayne C.; and Darsie, Burns, 4,105,052, Cl. 139-101.000.

Barbier, Xavier N.: *See—*
Aveneau, Andre A.; and Barbier, Xavier N., 4,105,869, Cl. 179-15.0BD.

Barcroft Company: *See—*
Glasscock, Green Bateman, 4,105,579, Cl. 252-317.000.

Barcus, Victor D., to General Electric Company. Auxiliary cooling device. 4,105,905, Cl. 310-59.000.

Bard, Charles L.; and Pfitzenmaier, Raymond W., to United States of America, Army. Machine gun barrel for firing blanks. 4,104,953, Cl. 89-14.00E.

Bardebes, David Paul. Fish hooks. 4,104,820, Cl. 43-36.000.

Bardwick, John, III, to Aztec Staging Co., Inc. Portable staging equipment. 4,104,835, Cl. 52-7.000.

Barnes, Arthur C.; and Barnes, Carl E., to Barson Corp. Polymerization of 2-pyrrolidone with alkaline catalyst and SO_2 chain initiator. 4,105,645, Cl. 528-313.000.

Barnes, Carl E.: *See—*
Barnes, Arthur C.; and Barnes, Carl E., 4,105,645, Cl. 528-313.000.

Barnes, Russell M.: *See—*
Deffner, John F.; Wendel, Donald W.; and Barnes, Russell M., 4,105,126, Cl. 211-49.00D.

Barnes, Thomas Malcolm, to Harsco Corporation. Method for production of refined steel. 4,105,439, Cl. 75-51.000.

Baron, David Alan; and Hampton, James Ronald, to Litton Systems, Inc. Microwave energy feed system for combination cooking apparatus. 4,105,886, Cl. 219-10.55E.

Barrows, Franklin Herbert: *See—*
Hunter, Byron Alexander; and Barrows, Franklin Herbert, 4,105,601, Cl. 521-95.000.

Barson Corp.: *See—*
Barnes, Arthur C.; and Barnes, Carl E., 4,105,645, Cl. 528-313.000.

Barten, Piet Gerard Joseph; and Bijma, Jan, to U.S. Philips Corporation. Static convergence unit, and a color display tube comprising a convergence unit having permanent magnets. 4,105,983, Cl. 335-212.000.

Bartlett, Rodney J.; and Morrey, John R., to United States of America, Energy. Isotope separation. 4,105,921, Cl. 250-423.00P.

BASF Aktiengesellschaft: *See—*
Boehlke, Klaus; Welz, Martin; Foerster, Peter; Sterzel, Hans-Josef; Wurmb, Rolf; and Matthies, Hans Georg, 4,105,624, Cl. 260-40.00R.
Dockner, Toni; Toussaint, Herbert; and Decker, Martin, 4,105,657, Cl. 260-239.00B.
Himmele, Walter; Hupfer, Leopold; Toussaint, Herbert; and Paul, Gerhard, 4,105,669, Cl. 260-307.00F.
Schulz, Bernhard; Paust, Joachim; and Schneider, Joachim, 4,105,855, Cl. 560-190.000.

BASF Wyandotte Corporation: *See—*
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,105,597, Cl. 521-159.000.

Bassner, Helmut: *See—*
Birner, Winfried; Mueller, Hans; Listmann, Horst; and Bassner, Helmut, 4,104,875, Cl. 60-202.000.

Battelle Development Corporation: *See—*
Schwerzel, Robert E.; Klosterman, Nancy E.; Kelly, John Robert; and Hillenbrand, Louis J., 4,105,014, Cl. 126-270.000.

Battelle Memorial Institute: *See—*
Gentaz, Claude; and Bienvenu, Gerard, 4,105,440, Cl. 75-66.000.

Battigelli, Jean A.: *See—*
Levecque, Marcel; and Battigelli, Jean A., 4,105,424, Cl. 65-3.00C.

Baublitz, Harvey W. Auxiliary clothes hanger support. 4,104,972, Cl. 108-31.000.

Baudin, Cecile: *See—*
Sigwalt, Pierre; Polton, Alain; Baudin, Cecile; and Miskovic, Mihajlo (Michel), 4,105,713, Cl. 260-879.000.

Bauer, Donald J.: *See*—
Eisele, Judith A.; and Bauer, Donald J., 4,105,747, Cl. 423-263.000.
Baugh, Benjamin Charles; Young, Norman R.; and Runnion, Glenmore J., to Unarco Industries, Inc. Checkstand. 4,105,096, Cl. 186-1.0AC.
Baumann, Georg; and Hoffmann, Helmut, to Draloric Electronic GmbH. Ceramic capacitor. 4,106,075, Cl. 361-320.000.
Baumann, Terry F.; and Brummer, Gerald W., to Amity Leather Products Company. Flexible receptacle with credit card holder. 4,105,057, Cl. 150-35.000.
Baxter Travenol Laboratories, Inc.: *See*—
Cammarata, Frank, III; Miller, Joe Alan; and Martin, Jerry D., 4,105,730, Cl. 264-89.000.
Macemon, James H., 4,105,967, Cl. 324-115.000.
Virag, Robert A., 4,105,029, Cl. 128-214.00R.
Bayer Aktiengesellschaft: *See*—
Blank, Heinz Ulrich, 4,105,692, Cl. 260-543.00R.
Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, 4,105,641, Cl. 526-712.000.
Dieterich, Dieter; and Markusch, Peter, 4,105,594, Cl. 521-100.000.
Eisenmann, Karl Heinz; and Broch, Karl Heinz, 4,105,595, Cl. 521-159.000.
Gottschlich, Alois; and Leverenz, Klaus, 4,105,655, Cl. 260-207.100.
Hardt, Dietrich; Serini, Volker; Vernaleken, Hugo; and Braese, Hans-Eberhard, 4,105,711, Cl. 260-873.000.
Harnisch, Horst, 4,105,665, Cl. 260-289.00C.
Margotte, Dieter; and Vernaleken, Hugo, 4,105,712, Cl. 260-873.000.
Muller, Erwin; and Thomas, Heinz, 4,105,600, Cl. 521-129.000.
von Oertzen, Klaus; Bien, Hans Samuel, deceased; and Bien, Gabriele, legal representative, 4,105,662, Cl. 544-294.000.
Bayfront Carpet and Vacuum, Inc.: *See*—
Moore, Barnard J., 4,105,420, Cl. 55-274.000.
Beall, John Horace. Line diverting tool. 4,105,189, Cl. 254-139.000.
Bean, Lloyd F., to Xerox Corporation. Transfer of conductive particles. 4,105,320, Cl. 355-3.0TR.
Bean, Samuel L.: *See*—
Swaine, James W., Jr.; Low, William W.; and Bean, Samuel L., 4,105,754, Cl. 423-514.000.
Beatrice Foods Co.: *See*—
Jones, John H.; and Hoffman, James T., 4,105,116, Cl. 206-484.000.
Beatty, John C., III, to Raymond, John L.; and Reath, Robert Z. Apparatus for removing impurities from electrolyte solutions. 4,105,534, Cl. 204-301.000.
Becker, Aaron J.; and Das, Subodh K., to Aluminum Company of America. Aluminum chloride production. 4,105,752, Cl. 423-496.000.
Becton, Dickinson and Company: *See*—
Antoshkiw, William T.; and Ursic, Thomas A., 4,105,022, Cl. 128-2.05F.
Gutcho, Sidney; McCarter, Henry; and Chanod, Edward, 4,105,410, Cl. 23-253.0TP.
Bedgood, Michael Albert; and Leach, John Stuart, to International Standard Electric Corporation. Single optical fiber connector. 4,105,285, Cl. 350-96.210.
Begley, Paul M.: *See*—
Laganis, Deno; and Begley, Paul M., 4,105,639, Cl. 528-177.000.
Beguin, Daniel E.; Bosc, Henri J.; and Colin, Jean-Marie H., to International Standard Electric Corporation. Radar system with circular polarized transmission and adaptive rain depolarization compensation. 4,106,015, Cl. 343-5.00W.
Behnke, Joachim; Frank, Dieter; and Wallrabenstein, Michael, to Akzona Incorporated. Stabilization of barium, strontium and calcium complexes of polyterephthaloyl oxalamidrazone and polydiphenylether-dicarboxylic acid-4,4'-oxalamidrazone. 4,105,620, Cl. 260-37.00N.
Bell, Albert H., III; and Zeek, Richard M., to General Motors Corporation. Two-stage regenerator seal. 4,105,062, Cl. 165-9.000.
Bell & Howell Company: *See*—
Wells, Thomas R.; and Dahlen, Theodore E., 4,105,312, Cl. 353-27.00R.
Wells, Thomas R.; and Kearney, Robert L., 4,105,319, Cl. 353-120.000.
Bell Ko-On Co., Ltd.: *See*—
Utsumi, Jihaciro, 4,105,306, Cl. 352-14.000.
Bell, Richard A.; Wallace, Earl C.; and Winters, Ted W., to General Engineering and Mfg. Corporation. Convertible sofa and bed structure. 4,104,747, Cl. 5-37.00R.
Bell Telephone Laboratories, Incorporated: *See*—
Arnold, Hamilton Webster; Tillotson, LeRoy Conrad; and Young, James Arthur, Jr., 4,105,973, Cl. 325-4.000.
Bjorklund, Gary Carl; and Liao, Paul Foo-Hung, 4,105,337, Cl. 356-114.000.
Bridges, Thomas James; and Burkhardt, Ernest Gardner, 4,105,919, Cl. 250-341.000.
Dick, George Wilmer, 4,106,009, Cl. 340-343.000.
Gloge, Detlef Christoph; Kaminow, Ivan Paul; and Presby, Herman Melvin, 4,105,283, Cl. 350-96.310.
Gordon, Alan Mayer; Mazurek, Edward Francis; and Wright, Arden Bernard, 4,106,070, Cl. 361-42.000.
Kustka, George John, 4,105,863, Cl. 178-67.000.
Paoli, Thomas Lee, 4,106,096, Cl. 364-481.000.
Bellaplast GmbH: *See*—
Thiel, Alfons W.; and Hell, Hans, 4,105,386, Cl. 425-217.000.
Bely, Nikolai Grigorievich: *See*—
Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.
Benda, Hans: *See*—
Amann, Rolf; Benda, Hans; and Dietterle, Albert, 4,105,230, Cl. 292-202.000.
Benes, Milan; and Peska, Jan, to Ceskoslovenska akademie ved. Quaternary salts of methacrylic or acrylic esters and cationic quaternary polyelectrolytes and ion exchange resins thereof. 4,105,858, Cl. 560-222.000.
Berenbaum, Morris B.: *See*—
Sweeney, Richard F.; Peterson, James O.; Sukornick, Bernard; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,105,691, Cl. 260-530.00R.
Bergan, Kenneth N., to Control Data Corporation. Current drive circuits. 4,106,088, Cl. 363-132.000.
Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased (by Plattner, Werner, administrator); Thiel, Max; and Vomel, Wolfgang, to Boehringer Mannheim GmbH. 3-Nitropyrazole compounds and anti-microbial compositions. 4,105,772, Cl. 424-269.000.
Berger, Sidney Ethan, to Union Carbide Corporation. Treated hydrated alumina. 4,105,465, Cl. 106-308.00Q.
Bergkamp, Helen G.; and Bergkamp, Robert L. Recipe card storage device and display means. 4,105,270, Cl. 312-330.00R.
Bergkamp, Robert L.: *See*—
Bergkamp, Helen G.; and Bergkamp, Robert L., 4,105,270, Cl. 312-330.00R.
Bergt, Carl, to General Electric Company. Space air conditioning control system and apparatus. 4,105,063, Cl. 165-21.000.
Berkelhammer, Gerald; and Kameswaran, Venkatamaran, to American Cyanamid Company. Insecticidal and acaricidal m-phenoxybenzyl esters of 2,2-difluoro-1,3-benzodioxole-5-(α-alkyl)acetic acids. 4,105,780, Cl. 424-282.000.
Berkovitz, Robert A., to Teledyne Industries, Inc. Stereo and spaciousness reverberation system using random access memory and multiplex. 4,105,864, Cl. 179-1.00J.
Bernasconi, Mario: *See*—
Vargiu, Silvio; Manzoni, Pier Luigi; Bernasconi, Mario; and Parodi, Antonio, 4,105,604, Cl. 260-17.200.
Bernet, Rudolf; Koller, Hans; and Wachberger, Eugen, to Hoffmann-La Roche Inc. Process and device for the automatic dilution of solutions. 4,105,137, Cl. 222-1.000.
Bertrams, Johannes Kurt, deceased; and by Mulkens, Casper Antonius Henricus, administrator, to U.S. Philips Corporation. Voltage rail. 4,105,099, Cl. 191-29.0DM.
Bidwell, Robert E.: *See*—
Kurtz, Leonard D.; and Bidwell, Robert E., 4,105,031, Cl. 128-276.000.
Bien, Else, legal representative: *See*—
von Oertzen, Klaus; Bien, Hans Samuel, deceased; and Bien, Gabriele, legal representative, 4,105,662, Cl. 544-294.000.
Bien, Gabriele, legal representative: *See*—
von Oertzen, Klaus; Bien, Hans Samuel, deceased; and Bien, Gabriele, legal representative, 4,105,662, Cl. 544-294.000.
Bien, Hans Samuel, deceased: *See*—
von Oertzen, Klaus; Bien, Hans Samuel, deceased; and Bien, Gabriele, legal representative, 4,105,662, Cl. 544-294.000.
Bienvenu, Gerard: *See*—
Gentaz, Claude; and Bienvenu, Gerard, 4,105,440, Cl. 75-66.000.
Bijma, Jan: *See*—
Barten, Piet Gerard Joseph; and Bijma, Jan, 4,105,983, Cl. 335-212.000.
Binks Manufacturing Company: *See*—
Lau, George W.; and Bujnowski, Edward J., 4,105,164, Cl. 239-526.000.
Biotronik Mess- und Therapiegerate GmbH & Co.: *See*—
Richter, Gerolf; and Shanks, Scott B., 4,105,037, Cl. 128-419.00P.
Birner, Winfried; Mueller, Hans; Listmann, Horst; and Bassner, Helmut, to Messerschmitt-Boelkow-Blohm GmbH. Ion prime mover. 4,104,875, Cl. 60-202.000.
Bishop, Robert C.: *See*—
Shanbrom, Edward; and Bishop, Robert C., 4,105,650, Cl. 260-112.00B.
Bitzel, Hubert: *See*—
Herb, Eugen; Petera, Theodor; and Bitzel, Hubert, 4,104,940, Cl. 83-71.000.
Biver, William Ralph, to Sybron Corporation. Device for determining the activated clotting time of a blood sample. 4,105,411, Cl. 23-253.00R.
Bizzell, David; and Makarainen, Eino A. Arrow mounted self-retracting sight. 4,105,209, Cl. 273-106.50R.
Bjorklund, Gary Carl; and Liao, Paul Foo-Hung, to Bell Telephone Laboratories, Incorporated. Self-induced rotation ellipsometer. 4,105,337, Cl. 356-114.000.
Black Clawson Company, The: *See*—
Seifert, Peter, 4,105,543, Cl. 209-240.000.
Blaich, Bernhard; Zehender, Ernst; and Kerner, Karl, to Robert Bosch GmbH. Silicon oxide coated metal having improved corrosion resistance. 4,105,821, Cl. 428-215.000.
Blake, James Edward: *See*—
Lambert, Thomas W.; and Blake, James Edward, 4,105,922, Cl. 250-495.00T.
Blakely, Donald W., to Chevron Research Company. Process for producing a particle pack composition comprising alumina and the resulting attrition resistant composition. 4,105,587, Cl. 252-439.000.

Blank, Heinz Ulrich, to Bayer Aktiengesellschaft. Process for the preparation of benzenesulphonyl chloride. 4,105,692, Cl. 260-543.00R.

Blinn, Ludwig, to Pohlig-Heckelbleichert Vereinigte Maschinenfabriken Aktiengesellschaft. Device for discharging bulk material. 4,105,143, Cl. 222-161.000.

Blomqvist, Ake Hugo Petrus; and Stalfors, Rolf Lennart, to AB Bofors. Device for receiving or transmitting radiation. 4,105,174, Cl. 244-3.160.

Blomstedt, Hans C. M., to Hans Blomstedt Handelsbolag. Pacifier. 4,105,032, Cl. 128-360.000.

Bloom, Allen; and Hung, Ling Kong, to RCA Corporation. Liquid crystalline 4''-cyano- or 4''-nitrobenzylidene-4'-(N,N-dialkylamino)-1-aminoazabenzene dyes. 4,105,654, Cl. 260-205.000.

Blunier, Dennis L.; and Clemens, Donald E., to Caterpillar Tractor Co. Track shoe and bolt retention arrangement. 4,105,260, Cl. 305-54.000.

Boah, John K.; and Kennedy, Richard W., to General Electric Company. Method of manufacture of a semiconductor device. 4,104,786, Cl. 29-583.000.

BOC Limited: *See—*
Marshall, Denis John; and Mohin, Terry Martin, 4,105,887, Cl. 219-72.000.

Bochis, Richard J.; and Tolman, Richard L., to Merck & Co., Inc. Imidazo[1,2-a] pyridines substituted with a thienyl, thiazolyl, or thiadiazolyl group. 4,105,767, Cl. 424-256.000.

Bodig, Bernd: *See—*
Jundt, Werner; Werner, Peter; Bodig, Bernd; Sohner, Gerhard; and Roth, Helmut, 4,105,006, Cl. 123-148.00E.

Boehlke, Klaus; Welz, Martin; Foerster, Peter; Sterzel, Hans-Josef; Wurmb, Rolf; and Matthies, Hans Georg, to BASF Aktiengesellschaft. Reinforced vinyl chloride polymer compositions containing poly-neopentylene terephthalate. 4,105,624, Cl. 260-40.00R.

Boehringer Ingelheim GmbH: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Reichl, Richard; and Giesemann, Rolf, 4,105,796, Cl. 424-330.000.
Kummer, Werner; Stahle, Helmut; Koppe, Herbert; Haarmann, Walter; and Reichl, Richard, 4,105,765, Cl. 424-248.560.

Boehringer Mannheim GmbH: *See—*
Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased; Thiel, Max; and Vomel, Wolfgang, 4,105,772, Cl. 424-269.000.
Braun, Hans, 4,104,807, Cl. 34-92.000.

Boeing Company, The: *See—*
Hardin, Robert H., 4,105,949, Cl. 331-37.000.
Larkworthy, Peter J.; Rose, James A.; and Martin, Anthony J., 4,104,964, Cl. 100-232.000.
Larsen, Hals Norman; and Kamber, Peter Werner, 4,104,876, Cl. 60-226.00R.
Martin, Donald L.; and Yanke, David B., 4,105,900, Cl. 307-219.000.

Bolin, Gustav Georg Arne. Sound resonator for amplifying sound waves. 4,104,945, Cl. 84-1.150.

Bolin, Philip C.: *See—*
Cookson, Alan H.; Kemeny, George A.; and Bolin, Philip C., 4,105,859, Cl. 174-14.00R.

Boling, Norman L., to Owens-Illinois, Inc. Q-switched laser and laser rod. 4,105,956, Cl. 331-94.50Q.

Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, to Hoffmann-La Roche Inc. 9-Phenyl 5,6-dimethyl-nona-2,4,6,8-tetraeonic acid compounds. 4,105,681, Cl. 260-404.000.

Bolle, Pierre: *See—*
Monnier, Denys; and Bolle, Pierre, 4,105,409, Cl. 23-232.00R.

Bonaddio, Robert M., to PPG Industries, Inc. Force applying device for scoring wheels. 4,104,939, Cl. 83-7.000.

Bond, Robert: *See—*
Lees, Geoffrey; Williams, Arthur Roger; and Bond, Robert, 4,105,458, Cl. 106-97.000.

Bone, Geoffrey Edward; and Allen, Peter Baguley, to Sperry Rand Limited. Suspension system for nozzle of jet propelled vehicle. 4,104,877, Cl. 60-230.000.

Bones, Roger John: *See—*
Baker, Derrick John; and Bones, Roger John, 4,105,834, Cl. 429-104.000.

Bonfanti, Ottavio. Method for the production of a synthetic material having a mother-of-pearl look. 4,105,733, Cl. 264-108.000.

Bonum-Werk Inh. Friedrich Hetzmannseder: *See—*
Hrabik, Heinrich, 4,104,818, Cl. 40-152.000.

Boone, David E.: *See—*
Hoff, Glen R.; Fotis, Peter, Jr.; and Boone, David E., 4,105,846, Cl. 526-124.000.

Borchert, Lothar; and Stenzel, Karl-Jorg, to Siemens Aktiengesellschaft. Low-current contact construction. 4,105,828, Cl. 428-665.000.

Borden, Inc.: *See—*
Flood, John Michael; Messervey, Clifford Harry; Dye, Richard; and O'Connor, Leo Patrick, 4,105,122, Cl. 209-73.000.

Borg-Warner Corporation: *See—*
Phillips, Bernard C., 4,104,994, Cl. 123-73.00R.

Borju, Jury Iosifovich: *See—*
Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.

Bork, C. Gary; and Kenan, John E. Barrier with internal drainage duct. 4,105,353, Cl. 404-2.000.

Bornfleth, Jay W., to United States of America, Navy. Servo type switching for remote automatic braking system. 4,105,258, Cl. 303-93.000.

Borsig GmbH: *See—*
Schindelhauer, Gerhard, 4,105,375, Cl. 418-54.000.

Borst, Hans; Evans, Reginald David Owen; and Rand, John Arthur, to Internationale Octrooi Maatschappij "Octropa" B.V. Dewaxing with a polymerized polyol ester dewaxing aid. 4,105,539, Cl. 208-33.000.

Bosc, Henri J.: *See—*
Beguin, Daniel E.; Bosc, Henri J.; and Colin, Jean-Marie H., 4,106,015, Cl. 343-5.00W.

Bothof, Delwin L.; Fowles, Richard G.; Heinzl, Johann J.; Novotny, David R.; Weisickle, Robert L.; Wetzel, John H.; and Winninghoff, Paul G., to Hewlett-Packard Company. Digitally controlled transmission impairment measuring apparatus. 4,105,995, Cl. 340-146.10E.

Bottger, Erik. Device for safety-helmet with ear mufflers. 4,104,743, Cl. 2-423.000.

Boucher, Rosaire. Endless track for a tracked vehicle. 4,105,259, Cl. 305-50.000.

Boudouris, Angelo, to Eprad Incorporated. Film transport system. 4,105,311, Cl. 352-187.000.

Bourgeois, Alain: *See—*
Bui-Hai, Nhu; and Bourgeois, Alain, 4,106,026, Cl. 343-786.000.

Bourguignon, Philippe: *See—*
Opron, Robert; Bourguignon, Philippe; and Guelton, Claude, 4,104,827, Cl. 49-385.000.

Bovagne, Rene, to Creusot-Loire. Device for locating a layer of tubes in an enclosure. 4,105,067, Cl. 165-159.000.

Bowen, Robert F.: *See—*
Freedman, George; and Bowen, Robert F., 4,104,957, Cl. 99-283.000.

Bowman, Bradshaw. Pattern forming wheel for uncured concrete surfaces. 4,105,354, Cl. 404-72.000.

Boylett, William Frederick, to Consultant Gas Engineer Limited. Fuel burners. 4,105,393, Cl. 431-116.000.

Boyne Mountain Lodge, Inc.: *See—*
Kircher, Everett F.; and Dilworth, James L., 4,105,161, Cl. 239-2.00S.

BP Canada: *See—*
Savard, Gilbert, 4,104,971, Cl. 104-172.00B.

BP Chemicals Limited: *See—*
Matheson, Ian Alastair, 4,105,585, Cl. 252-429.00B.

Bradberry, Carl. Miniature dental kit. 4,105,120, Cl. 206-581.000.

Bradshaw, William A.; and Dalgleish, Gerald, to American Flange & Manufacturing Co. Inc. Closure plug. 4,105,135, Cl. 220-288.000.

Brady, Michael Barry Clive: *See—*
Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, 4,105,951, Cl. 331-90.000.

Braese, Hans-Eberhard: *See—*
Hardt, Dietrich; Serini, Volker; Vernaleken, Hugo; and Braese, Hans-Eberhard, 4,105,711, Cl. 260-873.000.

Brass, Robert L., to General Mills Fun Group, Inc. Toy construction system having reusable distensible joining members. 4,104,952, Cl. 85-5.00R.

Braum, Ludwig, to Libandor Trading Corporation Inc. Method for checking coins and coin checking apparatus for the performance of the aforesaid method. 4,105,105, Cl. 194-100.00A.

Braun Aktiengesellschaft: *See—*
Karey, Hans; Oberheim, Robert; and Heintke, Hans-Eberhard, 4,106,080, Cl. 362-18.000.

Braun, Ernst; and Braun, Gert, to Halbach & Braun. Double chain conveyor construction. 4,105,110, Cl. 198-731.000.

Braun, Gert: *See—*
Braun, Ernst; and Braun, Gert, 4,105,110, Cl. 198-731.000.

Braun, Hans, to Boehringer Mannheim GmbH. Machine for the continuous preparation and packaging of freeze-dried materials. 4,104,807, Cl. 34-92.000.

Braund, Kenneth William; and Webster, John Lawrence, to A P Products Incorporated. Molded cable termination assembly with insert. 4,105,278, Cl. 339-103.00M.

Braunstein, David M.: *See—*
Semanchik, Michael; and Braunstein, David M., 4,105,637, Cl. 528-241.000.

Breaux, Earl J., to J. Ray McDermott & Co., Inc. Pipe cleaning brush assembly for pipe facing machine. 4,104,937, Cl. 82-34.00R.

Breitbard, Elford Barnett, to Tele-Quik, Inc. Telephone directory information support bracket. 4,105,181, Cl. 248-452.000.

Brenner, Bernd: *See—*
Buckl, Hans; Brenner, Bernd; and Eisenschmid, Wolfgang, 4,105,467, Cl. 127-37.000.

Brenta, Robert, to Brenta, Robert. Portable workshop. 4,105,055, Cl. 144-286.00R.

Brevetor S.A.: *See—*
Conne, Robert H., 4,106,074, Cl. 361-248.000.

Brichard, Jean; Colery, Jean-Claude; and Meuret, Fernand, to Interox. Particulate peroxygen compounds coated with sodium sesquicarbonate or $Na_2SO_4.mNa_2CO_3$. 4,105,827, Cl. 428-403.000.

Bridges, Thomas James; and Burkhardt, Ernest Gardner, to Bell Telephone Laboratories, Incorporated. Spectrophone with field tuning of absorption cell. 4,105,919, Cl. 250-341.000.

Bridgestone Tire Company Limited: *See—*
Suzuki, Masayoshi; Ooimi, Tatuo; Yabe, Toshinori; and Takahashi, Shoji, 4,105,487, Cl. 156-405.00R.

Brieger, Emmet F. Tubing conveyed sand consolidating method. 4,105,073, Cl. 166-286.000.

Brisco, Paul R. Hospital bed and patient-handling apparatus. 4,104,748, Cl. 5-63.000.

Bristol-Myers Company: *See—*
Partyka, Richard Anthony; Standridge, Robert Ted; Howell, Henry George; and Shulgin, Alexander Theodore, 4,105,695, Cl. 260-570.80R.

Brite-O-Matic Manufacturing, Inc.: *See—*
Gasser, William J.; and Cooper, Richard H., 4,104,756, Cl. 15-97.00B.

British Gas Corporation: *See—*
Banks, Reginald George Sinclair; and Williams, Alan, 4,105,591, Cl. 252-466.00J.
Smith, Ian, 4,105,972, Cl. 324-220.000.

British Petroleum Company Limited, The: *See—*
Oldham, Guy Franklin, 4,105,553, Cl. 210-73.00W.

British Steel Corporation (Chemicals) Limited: *See—*
Bruce, John McNicol, 4,105,503, Cl. 201-40.000.

Britt, Thomas O.: *See—*
Lennon, Carl L.; and Britt, Thomas O., 4,105,966, Cl. 324-113.000.

Broch, Karl Heinz: *See—*
Eisenmann, Karl Heinz; and Broch, Karl Heinz, 4,105,595, Cl. 521-159.000.

Broderick, Ross Thomas, to Deere & Company. Combination front-end loader bucket and refuse container. 4,105,131, Cl. 214-315.000.

Broillard, Bernard. Metering dispenser having suck-back through nozzle. 4,105,146, Cl. 222-383.000.

Broken Hill Proprietary Company Limited, The: *See—*
Debenham, Michael; Dalli, Allan George; and Revell, Peter Louis, 4,105,134, Cl. 220-268.000.

Brouard, Claude Marie Henri Emile; Dupont, Bernard; Leroy, Jean-Marie Louis; and Stiot, Jean-Pierre Henri, to Produits Chimiques Ugine Kuhlmann. Heteryl-azo-phenyl disperse dyestuffs containing a Z-substituted benzolyloxyalkyl radical, wherein Z is 2-cyanovinyl 2-cyanoethyl or 2-chloro-2-cyanoethyl. 4,105,653, Cl. 260-158.000.

Brown, Gordon Eldred. Composite railroad tie. 4,105,159, Cl. 238-36.000.

Brown, Harvey A.: *See—*
Huffman, William A.; and Brown, Harvey A., 4,105,299, Cl. 350-349.000.

Brown Jordan Company: *See—*
Colby, Donald Bruce, 4,105,244, Cl. 297-45.000.

Brown, Marvin R.: *See—*
Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., 4,105,603, Cl. 260-8.000.

Brownlee, Robert O., to Reid, William Clinton; and Brownlee, Robert O. Method of erecting a building construction. 4,104,844, Cl. 52-744.000.

Bruce, John McNicol, to British Steel Corporation (Chemicals) Limited. Method and apparatus for emission control of by-product coke ovens. 4,105,503, Cl. 201-40.000.

Brucken, Byron L.; and Watt, Roy E., to General Motors Corporation. Variable displacement compressor with three-piece housing. 4,105,370, Cl. 417-222.000.

Bruckner Apparatebau GmbH: *See—*
Schuierer, Manfred, 4,104,753, Cl. 8-152.000.

Brummer, Gerald W.: *See—*
Baumann, Terry F.; and Brummer, Gerald W., 4,105,057, Cl. 150-35.000.

Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, to Ciba-Geigy Corporation; and Sankyo Company, Limited. Derivatives of 4-oxopiperidines and their use as polymer stabilizers. 4,105,626, Cl. 260-45.8NZ.

Brunnengraber, Hermann, to Gebr. Hofmann KG, Maschinenfabrik. Balancing machine circuit for eliminating unbalances. 4,104,919, Cl. 73-462.000.

Buchwald, Robert M., to General Motors Corporation. Independent front suspension system. 4,105,222, Cl. 280-668.000.

Bucker, Henrique Oswaldo. Inflatable parachute for use as escape or sporting device. 4,105,173, Cl. 244-146.000.

Buckeye International, Inc.: *See—*
Spencer, Benjamin B., 4,105,128, Cl. 213-61.000.

Buckl, Hans; Brenner, Bernd; and Eisenschmid, Wolfgang, to Sud-Chemie Aktiengesellschaft. Process for two-stage digestion of natural products containing xylane, in order to obtain xylose. 4,105,467, Cl. 127-37.000.

Buckler, Sheldon A., to Polaroid Corporation. Flat battery with electrodes in slurry form. 4,105,815, Cl. 429-152.000.

Bud Antle, Inc.: *See—*
Ingram, Lawrence L.; and Infante, Javier D., 4,104,975, Cl. 111-3.000.

Buhler, Gerhard, to FRYMA-Maschinen AG. Heat exchanger. 4,105,066, Cl. 165-94.000.

Bui-Hai, Nhu; and Bourgeois, Alain, to Thomson-CSF. Corrugated horn with a low standing wave ratio. 4,106,026, Cl. 343-786.000.

Bujnowski, Edward J.: *See—*
Lau, George W.; and Bujnowski, Edward J., 4,105,164, Cl. 239-526.000.

Bukac, Zbynek; Sebenda, Jan; and Loyda, Miloslav, to Ceskoslovenska akademie ved. Anionic polymerization of caprolactam at a temperature below the melting point of polycaprolactam. 4,105,644, Cl. 528-314.000.

Bukhman, Inokh Borukhovich: *See—*
Aizenberg, Julian Borisovich; Bukhman, Inokh Borukhovich; and Pyatigorsky, Vladimir Mikhailovich, 4,105,293, Cl. 350-264.000.

Bundy, Gordon L., to Upjohn Company, The. 13,14-Dihydro-9-deoxy-PGF_2 compounds. 4,105,682, Cl. 260-408.000.

Bundy, Richard P.: *See—*
Rheinfrank, Lamson, Jr.; Bundy, Richard P.; and Clements, Jack T., 4,105,421, Cl. 55-379.000.

Bunker Ramo Corporation: *See—*
Nijman, John Peter, 4,106,024, Cl. 343-715.000.

Bunn, Stuart E.; and Owsley, Herbert B., to Ball Valve Company, Inc. Screw locking arrangement. 4,105,058, Cl. 151-41.740.

Burdick, Kenneth John; Constable, Douglas William; and Wheeler, Robert Charles, to GTE Sylvania Incorporated. Automatic color level control system with threshold tracking. 4,106,055, Cl. 358-27.000.

Burger, John P., to Raymond Lee Organization, Inc., The. Hook-on necktie conversion kit. 4,104,739, Cl. 2-155.000.

Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., to Atlantic Richfield Company. Process for removing sulfur from coal. 4,105,416, Cl. 44-1.00R.

Burkey, David J.; and Rosenau, Clifford M., to Armstrong Cork Company. Nailable vinyl chloride-based injection-molding compound. 4,105,717, Cl. 260-889.000.

Burkhardt, Ernest Gardner: *See—*
Bridges, Thomas James; and Burkhardt, Ernest Gardner, 4,105,919, Cl. 250-341.000.

Burley, Joseph: *See—*
Hutton, Ronald E.; Oakes, Vincent; and Burley, Joseph, 4,105,684, Cl. 260-429.700.

Burnett, James E., to Mead Corporation, The. Density control for ink jet copier. 4,106,061, Cl. 358-296.000.

Burroughs Corporation: *See—*
Millers, Donald Alexander, II., 4,106,092, Cl. 364-200.000.

Burysek, Frantisek: *See—*
Mikulecky, Karel; Tyl, Miloslav; Janousek, Jan; Burysek, Frantisek; Skoda, Stanislav; and Esner, Stanislav, 4,104,854, Cl. 57-34.00R.

Burzin, Klaus: *See—*
Rueter, Joern; Burzin, Klaus; Magosch, Karl-Heinz; and Feinauer, Roland, 4,105,672, Cl. 260-340.200.

Busch, Norbert: *See—*
Mauvernay, Roland Yves; Busch, Norbert; and Moleyre, Jacques, 4,105,785, Cl. 424-285.000.

Busse, Oswald; and Klesper, Hugo, to Passavant-Werke Michelbacher Hutte. Plate-type filter press. 4,105,559, Cl. 210-225.000.

Bussjager, Rudy C.: *See—*
Del Toro, James J.; and Bussjager, Rudy C., 4,105,064, Cl. 165-29.000.

Butin, Henri: *See—*
Lechevin, Rene; and Butin, Henri, 4,105,981, Cl. 329-50.000.

Butler Manufacturing Company: *See—*
Steenson, Thomas W.; and Paton, W. Donald, 4,105,240, Cl. 294-81.00R.

Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, to Bayer Aktiengesellschaft. Process for the preparation of aliphatic polycarbonates and polyurethanes therefrom. 4,105,641, Cl. 526-712.000.

C. Hohage & Cie. KG: *See—*
Holl, Friedrich, 4,105,127, Cl. 211-124.000.

Cabot Corporation: *See—*
Horn, John H.; Morehead, William R.; Hurst, Ronald C.; Potter, Dennis J.; and Schaub, Clyde D., 4,105,750, Cl. 423-456.000.

Caccioli, Anthony; Carlson, Philip A.; and Guidi, David M., to Gulf & Western Manufacturing Company. Automotive press. 4,104,776, Cl. 29-281.300.

Caillol, Alain, to Societe d'Etudes Chimiques. Process and installation for the manufacture of chlorine dioxide. 4,105,751, Cl. 423-478.000.

Cal-Wood Door: *See—*
Naslund, Edwin N.; and MacDonald, Ian, 4,104,828, Cl. 49-399.000.

Calbiochem-Behring Corp.: *See—*
Drell, William; and Pollard, John Kingsley, Jr., 4,105,794, Cl. 424-317.000.

Calderoni, Sergio L., to General Motors Corporation. Contour die milling with a toroidal cutter. 4,104,943, Cl. 90-11.00C.

Caldwell, John W. Cluster assembly means for articles of furniture and articles incorporating the same. 4,105,250, Cl. 297-445.000.

California Institute of Technology: *See—*
Yen, Shiao-Ping S.; Rembaum, Alan; and Molday, Robert S., 4,105,598, Cl. 521-53.000.

California R & D Center: *See—*
Jones, Lawrence T.; and Jacobs, William, 4,105,210, Cl. 273-126.00R.

Callahan, James J., to Houdaille Industries, Inc. Single line lubricant reversing feeder. 4,105,094, Cl. 184-7.00F.

Calzolari, Sergio, to Fogt Industriemaschinenvertretung A.G. Fluid distributor device for controlling an apparatus for pumping wet concrete and the like. 4,105,373, Cl. 417-317.000.

Cammarata, Frank, III; Miller, Joe Alan; and Martin, Jerry D., to Baxter Travenol Laboratories, Inc. Method of making a flexible, collapsible container for liquids with improved tail seal. 4,105,730, Cl. 264-89.000.

Campbell, E. Calvin, Jr. Surface finish for statuary. 4,105,812, Cl. 428-15.000.

Campbell, John J., to Caterpillar Tractor Co. Planet gear positioning and retaining mechanism. 4,104,933, Cl. 74-801.000.

Campbell, John R.; and Klopfer, Howard J., to General Electric Company. Process for preparing phenyl trichloro-ethanes. 4,105,857, Cl. 568-726.000.

Camr, Rudolf: *See—*
Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, 4,105,744, Cl. 423-239.000.

Canada-Cities Service, Ltd.: *See*—
McQuitty, Stanley, 4,105,537, Cl. 208-11.0LE.
Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See*—
McQuitty, Stanley, 4,105,537, Cl. 208-11.0LE.
Canon Kabushiki Kaisha: *See*—
Ito, Fumio; Ito, Tadashi; Sunouchi, Akio; and Sorimachi, Kanehiro, 4,106,040, Cl. 354-205.000.
Kawakita, Yukimasa; and Okuno, Youichi, 4,106,038, Cl. 354-155.000.
Nakamoto, Soichi; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,106,033, Cl. 354-23.00D.
Nakamura, Zenzo; and Hasegawa, Goro, 4,106,037, Cl. 354-128.000.
Shinohara, Yukimasa; Ohara, Katsunobu; and Ando, Yujiro, 4,105,444, Cl. 96-1.00R.
Tanaka, Nobuyoshi; Ayata, Naoki; Takeda, Mitsuo; Matsumura, Susumu; and Matsumoto, Kazuya, 4,105,335, Cl. 356-108.000.
Tsuji, Sadahiko, 4,105,291, Cl. 350-184.000.
Cantarutti, Armindo, to NRM Corporation. Tire component transfer. 4,105,486, Cl. 156-405.00R.
Capra, Nicholas G., to Pauls, James D.; and Lewis, J. Claybrook, part interest to each. Mechanically operated dispensing device. 4,105,145, Cl. 222-340.000.
Car Cuf Industries, Inc.: *See*—
Tankel, Lawrence, 4,104,895, Cl. 70-237.000.
Carella, Vincent: *See*—
Cooper, Julius; Carella, Vincent; Nielsen, Edwin; and Nemeth, Henry, 4,105,207, Cl. 273-89.000.
Carkhuff, Donald W.: *See*—
Hill, Clifford W.; Carkhuff, Donald W.; and Pilia, Frank J., 4,105,891, Cl. 219-137.430.
Carl Still, Firma: *See*—
Lorenz, Kurt, 4,105,504, Cl. 202-91.000.
Carley, Harold E.: *See*—
Miller, George A.; and Carley, Harold E., 4,105,762, Cl. 424-245.000.
Carlson, Philip A.: *See*—
Caccioli, Anthony; Carlson, Philip A.; and Guidi, David M., 4,104,776, Cl. 29-281.300.
Carrier Corporation: *See*—
Del Toro, James J.; and Bussjager, Rudy C., 4,105,064, Cl. 165-29.000.
Harvey, Samuel E.; Whitehead, James Stephen; and Goranson, Paul L., 4,105,129, Cl. 214-152.000.
Reedy, Wayne R.; and Eplett, Fredrick R., 4,104,888, Cl. 62-80.000.
Carroll, Andrew C., to Raymond Lee Organization, Inc., The. Scissors. 4,104,794, Cl. 30-268.000.
Carstedt, Howard B. Pulsating glue head for folding machines. 4,104,983, Cl. 118-2.000.
Carter Equipment Co., Inc.: *See*—
Carter, William D.; and Mueller, Martin S., 4,105,329, Cl. 355-91.000.
Carter, William D.; and Mueller, Martin S., to Carter Equipment Co., Inc. Total immersion transfer of photographic images between sprocket-registered strips of film. 4,105,329, Cl. 355-91.000.
Caruel, Jacques E. J.; and Stora, Guy D., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Double-walled combustion chamber shell having combined convective wall cooling and film cooling. 4,104,874, Cl. 60-39.650.
Casey, Richard W. Child safety device for retaining electrical plugs. 4,105,274, Cl. 339-75.00P.
Cashen, Norton A.: *See*—
Andrews, Bethlehem K.; Harper, Robert J., Jr.; and Cashen, Norton A., 4,105,403, Cl. 8-115.000.
Caspar, Heinz; Kudritzki, Felix; and Ziegler, Horst, to Siemens Aktiengesellschaft. Pressure difference measuring apparatus. 4,104,924, Cl. 73-716.000.
Caspar, Heinz; and Kudritzki, Felix, to Siemens Aktiengesellschaft. Pressure or pressure difference measuring apparatus. 4,104,925, Cl. 73-716.000.
Castillo, Adolfo, to Automabed Building Components, Inc. Press. 4,104,962, Cl. 100-100.000.
Caterpillar Tractor Co.: *See*—
Blunier, Dennis L.; and Clemens, Donald E., 4,105,260, Cl. 305-54.000.
Campbell, John J., 4,104,933, Cl. 74-801.000.
Gilbert, Russell L., 4,105,078, Cl. 172-781.000.
Schexnayder, Lawrence F., 4,105,214, Cl. 277-74.000.
Cathell, Frank, to Qualidyne Systems, Inc. Full wave bridge power inverter. 4,105,957, Cl. 331-110.000.
Cease, James W., to Fine, Robert H. Ferrule forming assembly. 4,104,902, Cl. 72-117.000.
Celanese Corporation: *See*—
Frey, William J.; and Meyer, Paul L., 4,105,226, Cl. 285-175.000.
Gross, Arthur L., 4,105,793, Cl. 424-314.000.
Hanson, Harry T.; and Gordon, Marvin, 4,105,634, Cl. 526-65.000.
Larkin, Donald R., 4,105,701, Cl. 260-650.00R.
Lee, Wei-Kuo, 4,105,728, Cl. 264-40.700.
Semanchik, Michael; and Braunstein, David M., 4,105,637, Cl. 528-241.000.
Taylor, Paul D., 4,105,677, Cl. 260-346.110.
Taylor, Paul D., 4,105,678, Cl. 260-346.110.
Centre Europeen de Recherches Mauvernay: *See*—
Mauvernay, Roland Yves; Busch, Norbert; and Moleyre, Jacques, 4,105,785, Cl. 424-285.000.
Cerra, Raffaele; and Scherillo, Michele. Devices for determining errors of siting, especially in radar systems. 4,106,016, Cl. 343-7.400.
Ceskoslovenska akademie ved: *See*—
Benes, Milan; and Peska, Jan, 4,105,858, Cl. 560-222.000.
Bukac, Zbynek; Sebenda, Jan; and Loyda, Miloslav, 4,105,644, Cl. 528-314.000.
Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, 4,105,744, Cl. 423-239.000.
Ceuppens, Willy Gabriel: *See*—
Stievenart, Emile Frans; Deconinck, Hugo Frans; and Ceuppens, Willy Gabriel, 4,105,198, Cl. 271-14.000.
Cha, Chang Yul, to Occidental Oil Shale. Process for recovering carbonaceous values from post in situ oil shale retorting. 4,105,072, Cl. 166-261.000.
Chabardes, Pierre, to Rhone-Poulenc Industries. Process for the preparation of α, β-ethylenic aldehydes. 4,105,697, Cl. 260-601.00R.
Chamberlin, Donald W.: *See*—
Irving, Donald W.; and Chamberlin, Donald W., 4,105,123, Cl. 209-111.600.
Chambers, Ramon P.: *See*—
Sanders, David E.; Chambers, Ramon P.; and Gordy, Robert S., 4,105,975, Cl. 325-320.000.
Chambley, Phillip W.; and Norris, Alan H., to Champion International Corporation. Self twist yarn strand system. 4,104,855, Cl. 57-77.300.
Champion International Corporation: *See*—
Chambley, Phillip W.; and Norris, Alan H., 4,104,855, Cl. 57-77.300.
Locke, Frank W., 4,105,153, Cl. 229-23.00R.
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., to Quaker Oats Company, The. Process for the production of a casein substitute. 4,105,799, Cl. 426-44.000.
Chang, Wen-Hsuan: *See*—
Wang, Yen; and Chang, Wen-Hsuan, 4,105,025, Cl. 128-90.000.
Chanod, Edward: *See*—
Gutcho, Sidney; McCarter, Henry; and Chanod, Edward, 4,105,410, Cl. 23-253.0TP.
Chapel, Annette Moore: *See*—
Horvath, Ralph S.; and Chapel, Annette Moore, 4,105,115, Cl. 206-370.000.
Chapman, Herbert Hill, Jr., to RCA Corporation. Electronic mail box. 4,106,060, Cl. 358-256.000.
Chappatte, Jean-Maurice, to Ebauches Electroniques S.A. Timepiece. 4,104,866, Cl. 58-85.500.
Charbonnier, Jean, to Societe de Vente de l'Aluminium Pechiney. Crucible for the thermal analysis of aluminum alloys. 4,105,191, Cl. 266-88.000.
Chase, Michael John, to Imperial Chemical Industries Limited. Pressure resistant member. 4,104,878, Cl. 60-245.000.
Chatterjee, Pronoy Kumar; and Morbey, Graham Kenneth, to Personal Products Company. Powdered grafted cellulose. 4,105,033, Cl. 128-285.000.
Chauvy, Jean-Daniel, to Gillette Company, The. Production of shaving foil. 4,105,493, Cl. 156-644.000.
Cheek, Alton E. Jarring tool. 4,105,082, Cl. 175-302.000.
Chemische Werke Huels Aktiengesellschaft: *See*—
Rueter, Joern; Burzin, Klaus; Magosch, Karl-Heinz; and Feinauer, Roland, 4,105,672, Cl. 260-340.200.
Chen, Thomas T.: *See*—
Wolfshagen, Ronald G.; Ypma, John E.; Murray, Glen W.; and Chen, Thomas T., 4,106,106, Cl. 365-2.000.
Cherry, Brian Wilson: *See*—
Atkin, Howard Dawson; Stachurski, Zbigniew Henryk; and Cherry, Brian Wilson, 4,105,117, Cl. 206-501.000.
Chester, Arnold M. Temperature responsive valve seal. 4,105,040, Cl. 137-72.000.
Chevron Research Company: *See*—
Blakely, Donald W., 4,105,587, Cl. 252-439.000.
Suzuki, Shigeto, 4,105,687, Cl. 260-465.400.
Chicago Bridge & Iron Company: *See*—
Tam, William A., 4,105,068, Cl. 166-355.000.
Chicoine, Gustave J. Manual downshift deacceleration warning light system. 4,105,994, Cl. 340-71.000.
Chihak, Paul P.; and Wehage, Charles H., to Rockwell International Corporation. Method and apparatus for reducing interference between plural radio altimeters. 4,106,018, Cl. 343-12.00A.
Children's Hospital Medical Center: *See*—
Moore, Robert E.; and Clark, Leland C., Jr., 4,105,798, Cl. 424-352.000.
Chirico, Anthony Nicholas, to Ecodyne Corporation. Heat exchanger. 4,105,065, Cl. 165-78.000.
Chism, Van B. Archery bowstring release. 4,105,011, Cl. 124-35.00A.
Chivens, Donald R.; and Kelm, Edward C., to Lexitron Corporation. Print element having flexible characters. 4,105,341, Cl. 400-144.200.
Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, to Kumiai Chemical Industry Co., Ltd. Process for producing 2-alkylbenzanilide. 4,105,693, Cl. 260-558.00P.
Cho, Kichinosuke; and Watanabe, Tsutomu, to Kabushiki Kaisha Art Coffee. Process for producing carbonated coffee drink. 4,105,802, Cl. 426-329.000.
Cho, Tae Han. Tennis trainer. 4,105,203, Cl. 273-29.00A.
Choi, Charles K., to Occidental Petroleum Corporation. Simplified liquefaction pyrolysis process and apparatus therefor. 4,105,502, Cl. 201-12.000.
CHON Corporation: *See*—
Oppolzer, Wolfgang, 4,105,853, Cl. 560-24.000.
Christidis, Yani; and Schouteten, Alain, to Nobel Hoechst Chimie.

Process for manufacturing N-acyl derivatives of hydroxy-arylglycines. 4,105,690, Cl. 260-519.000.
Chrysler Corporation: *See—*
Fenn, Gordon William, 4,104,998, Cl. 123-117.00R.
Chung, Rack H., to GAF Corporation. Process for the preparation of 1-aminoanthraquinones. 4,105,680, Cl. 260-378.000.
Church, Larry L.: *See—*
Sun, Shan C.; and Church, Larry L., 4,106,071, Cl. 361-79.000.
Churchman, M. Steele. Endboard auxiliary device for beds. 4,104,751, Cl. 5-327.00R.
Ciba-Geigy Corporation: *See—*
Back, Gerhard, 4,105,400, Cl. 8-43.000.
Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,105,626, Cl. 260-45.8NZ.
Fory, Werner; and Fischer, Hanspeter, 4,105,685, Cl. 260-448.20N.
Gruber, Urs; Greber, Gerd; and Kriemler, Hans-Peter, 4,105,648, Cl. 526-204.000.
Koci, Zdenek; and Mollet, Hans, 4,105,401, Cl. 8-79.000.
Luthi, Christian, 4,105,399, Cl. 8-1.00W.
Winter, Roland A. E., 4,105,630, Cl. 260-45.80R.
Winter, Roland A. E., 4,105,646, Cl. 528-311.000.
Ciba Geigy (UK) Limited: *See—*
Smith, Malcolm John; Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, 4,105,551, Cl. 210-58.000.
Cincinnati Milacron Inc.: *See—*
Kellermann, Arnold LeRoy; McDonald, David Ian; and Grone, Robert Joseph, 4,104,984, Cl. 118-2.000.
Cink, Josef: *See—*
Jakl, Vladimir; Cink, Josef; and Bacovsky, Filip, 4,104,823, Cl. 47-1.00R.
Cislaghi, Ezio; Scotti, Alessandro; and Pederzini, Renzo, to Honeywell Information Systems Italia. Semiconductor dynamic memory and related refreshing system. 4,106,108, Cl. 365-222.000.
Clark, Leland C., Jr.: *See—*
Moore, Robert E.; and Clark, Leland C., Jr., 4,105,798, Cl. 424-352.000.
Clark, Raleigh E. Rear view mirror assembly. 4,105,183, Cl. 248-484.000.
Clark, Timmy. Apparatus and method for transcribing musical notations. 4,104,949, Cl. 84-462.000.
Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., to United States of America, Army. Method of manufacture and retina for pyroelectric vidicon. 4,104,771, Cl. 29-25.140.
Clark, William H.; and Skinner, Charles E., to Dow Corning Corporation. Organic solvent dispersions of silicone elastomers. 4,105,617, Cl. 260-31.20N.
Clavelloux, Noel; Peynaud, Francois; and Posseme, Gilles, to Thomson-CSF. System for taking current-metering measurements. 4,104,912, Cl. 73-189.000.
Clawson, Robert G.: *See—*
La Barge, Robert L.; and Clawson, Robert G., 4,105,133, Cl. 220-266.000.
Clay, Burton Ross; and Gore, Douglas Alan, to RCA Corporation. Deflection-type modulator of laser beam for communications. 4,105,915, Cl. 250-199.000.
Clayton Dewandre Company Limited: *See—*
Levington, Henry John, 4,105,087, Cl. 180-89.150.
Cleary, Edward Joseph, Jr.; and Reiney, Michael Goodwin, to Tektronix, Inc. "Slewed pulse" scope sweep calibrator. 4,105,932, Cl. 315-377.000.
Clemens, Donald E.: *See—*
Blunier, Dennis L.; and Clemens, Donald E., 4,105,260, Cl. 305-54.000.
Clements, Jack T.: *See—*
Rheinfrank, Lamson, Jr.; Bundy, Richard P.; and Clements, Jack T., 4,105,421, Cl. 55-379.000.
Cleveland Bridge & Engineering Co., Ltd., The: *See—*
Knox, Hugh Stewart Geddes, 4,105,167, Cl. 242-54.00R.
Cloots, Henry R., to Waukesha Foundry Company, Inc. Apparatus for mixing particulate material in a liquid. 4,106,117, Cl. 366-154.000.
Clope, Richard W.; and Glaser, Milton A., to Dexter Corporation, The. Epoxy hydroxol primer. 4,105,613, Cl. 260-29.40R.
Clutter, Melvin E.: *See—*
West, Edward L.; and Clutter, Melvin E., 4,105,272, Cl. 339-14.00L.
Coal Industry (Patents) Limited: *See—*
Highley, John; and Vickers, Michael Alan, 4,105,419, Cl. 48-61.000.
Coast, John B. Crustacean claw-processing machine. 4,104,764, Cl. 17-71.000.
Coca-Cola Company, The: *See—*
Iacobucci, Guillermo A.; and Sweeny, James G., 4,105,675, Cl. 260-345.200.
Cockshott, Charles Peter; and Moore, John Howard, to Lucas Industries Limited. Apparatus for measuring the mass flow of a fluid. 4,104,913, Cl. 73-194.00F.
Coffinberry, George A., to United States of America, National Aeronautics and Space Administration. Fuel delivery system including heat exchanger means. 4,104,873, Cl. 60-39.28R.
Cohen, Louis, to B. F. Goodrich Company, The. Internally coated reaction vessel for use in olefinic polymerization. 4,105,840, Cl. 526-62.000.
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Steroid total synthesis process utilizing a cyanoalkyl A-ring precursor. 4,105,676, Cl. 260-345.90S.
Coils, Inc.: *See—*
Plunkett, James P., 4,105,985, Cl. 336-90.000.
Colby, Donald Bruce, to Brown Jordan Company. Foldable furniture unit. 4,105,244, Cl. 297-45.000.
Coleman, William E., to NCR Corporation. Load and hold means for plasma display devices. 4,105,930, Cl. 315-169.0TV.
Colery, Jean-Claude: *See—*
Brichard, Jean; Colery, Jean-Claude; and Meuret, Fernand, 4,105,827, Cl. 428-403.000.
Colescott, Robert L.; and Tregear, Geoffrey W., to Armour Pharmaceutical Company. Synthesis of peptides with parathyroid hormone activity. 4,105,602, Cl. 260-8.000.
Colgate-Palmolive Company: *See—*
Schreiber, Ronald Stanley, 4,105,758, Cl. 424-49.000.
Schreiber, Ronald Stanley; and Duff, Edward John, 4,105,759, Cl. 424-52.000.
Colin, Jean-Marie H.: *See—*
Beguin, Daniel E.; Bosc, Henri J.; and Colin, Jean-Marie H., 4,106,015, Cl. 343-5.00W.
Collins, David John; Kay, Ian Trevor; and Slater, John Walter, to Imperial Chemical Industries Limited. Selective herbicides. 4,105,433, Cl. 71-93.000.
Collins, Jerome H., to Procter & Gamble Company, The. Liquid detergent compositions. 4,105,592, Cl. 252-545.000.
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Radici, Pierino; Custro, Sergio; Ermoni, Mario; and Colombo, Paolo, 4,105,638, Cl. 528-130.000.
Color Communications, Inc.: *See—*
Day, Frederick A.; and Garbark, Melvin D., 4,104,809, Cl. 35-28.500.
Columbus McKinnon Corporation: *See—*
Ulbing, Otmar M.; and Koval, Edmund R., 4,105,882, Cl. 200-157.000.
Combustion Engineering, Inc.: *See—*
D'Amaddio, Eugene Raymond; and Enegess, David Norman, 4,105,556, Cl. 210-152.000.
Comfort Products, Inc.: *See—*
Rinehart, Dixie L., 4,104,740, Cl. 2-158.000.
Commissariat a l'Energie Atomique: *See—*
Arod, Jean; Gauthier, Michele; and Platzer, Roger, 4,105,508, Cl. 204-1.00T.
Germain, Michel, 4,105,683, Cl. 260-429.100.
Therond, Jean-Paul, 4,105,496, Cl. 176-19.00R.
Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris": *See—*
Dumont, Michel Paul; and Lamy, Jacques Edouard, 4,104,886, Cl. 61-112.000.
Compton, Robert N.; Reinhardt, Paul W.; and Garrett, William R., to United States of America, Energy. Method and apparatus for providing negative ions of actinide-metal hexafluorides. 4,105,746, Cl. 423-251.000.
Conder, Terrence M.; and Jones, Terence A., to Minnesota Mining and Manufacturing Company. Optical element to assure a minimum spacing. 4,105,292, Cl. 350-211.000.
Conne, Robert H., to Brevetor S.A. Triggering head for devices controlled by an electric power input. 4,106,074, Cl. 361-248.000.
Constable, Douglas William: *See—*
Burdick, Kenneth John; Constable, Douglas William; and Wheeler, Robert Charles, 4,106,055, Cl. 358-27.000.
Consultant Gas Engineer Limited: *See—*
Boylett, William Frederick, 4,105,393, Cl. 431-116.000.
Consumer Concepts, Inc.: *See—*
Orenstein, Henry, 4,105,885, Cl. 200-52.00R.
Continental Oil Company: *See—*
Oertle, Donald H., 4,104,906, Cl. 73-104.000.
Reusch, Robert J., 4,104,806, Cl. 34-10.000.
Sifferman, Thomas R.; and Sparlin, Derry D., 4,105,618, Cl. 260-33.6UA.
Starks, Charles M.; and Lundeen, Allan J., 4,105,698, Cl. 568-744.000.
Starks, Charles M., 4,105,699, Cl. 568-744.000.
Control Components, Inc.: *See—*
Self, Richard E., 4,105,048, Cl. 138-42.000.
Control Data Corporation: *See—*
Bergan, Kenneth N., 4,106,088, Cl. 363-132.000.
Cookson, Alan H.; Kemeny, George A.; and Bolin, Philip C., to Westinghouse Electric Corp. Compartmentalized gas insulated transmission line. 4,105,859, Cl. 174-14.00R.
Coon, Marvin D., deceased; and by MacPherson, John Hugh, agent. Fuel additive. 4,105,417, Cl. 44-63.000.
Cooper, Julius; Carella, Vincent; Nielsen, Edwin; and Nemeth, Henry, to Ideal Toy Corporation. Pinball type baseball game. 4,105,207, Cl. 273-89.000.
Cooper, Leonard W. Connection plate for panels of a concrete form. 4,105,185, Cl. 249-194.000.
Cooper, Richard H.: *See—*
Gasser, William J.; and Cooper, Richard H., 4,104,756, Cl. 15-97.00B.
Cooperativa Central Dos Productores de Acucar e Alcool do Estado de Sao Paulo: *See—*
Da Silva, Wilson Marcelo, 4,105,893, Cl. 219-316.000.
Coors Container Company: *See—*
Huffman, Stanley S., 4,105,103, Cl. 193-32.000.
Copal Company Limited: *See—*
Okabe, Katsuhiko, 4,104,967, Cl. 101-99.000.

Copeland Corporation: *See*—
Scharf, Philip H., 4,105,374, Cl. 417-415.000.
Copenhefer, John E.: *See*—
Latakas, Bernard; Copenhefer, John E.; and House, Robert M., 4,105,423, Cl. 55-501.000.
Corban Industries, Inc.: *See*—
Lass, Harold M., 4,105,490, Cl. 156-526.000.
Corbellini, Margherita: *See*—
Balducci, Agostino; Corbellini, Margherita; Mormino, Vittorio; Notari, Bruno; and Rivola, Luigi, 4,105,588, Cl. 252-454.000.
Coria, Yolanda Teevin: *See*—
Lopez, Tiburcio Coria; and Coria, Yolanda Teevin, 4,105,113, Cl. 206-100.000.
Corman, Edward M.: *See*—
Balzer, Claude P.; and Corman, Edward M., 4,104,839, Cl. 52-288.000.
Cornell Research Foundation, Inc.: *See*—
Resler, Edwin L., Jr., 4,104,989, Cl. 123-32.0ST.
Resler, Edwin L., Jr., 4,105,008, Cl. 123-191.00R.
Resler, Edwin L., Jr., 4,105,009, Cl. 123-193.00H.
Corner, Michael Raymond; and Jackson, William Lewis, to Dunlop Limited. Wheel with rim embraced by tire. 4,105,254, Cl. 301-63.0DS.
Corning Glass Works: *See*—
Elmer, Thomas H., 4,105,427, Cl. 65-30.00R.
Hertl, William; and Ramsey, William S., 4,105,498, Cl. 195-59.000.
Olshansky, Robert, 4,105,284, Cl. 350-96.330.
Corning Limited: *See*—
Tunnicliffe, George, 4,105,061, Cl. 165-1.000.
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Evani, Syamalarao; and Corson, Frederick P., 4,105,649, Cl. 526-271.000.
Cosco, Robert J., to GTE Sylvania Incorporated. Shunt triggered flashtube having safety feature. 4,105,929, Cl. 315-125.000.
Cosden Technology, Inc.: *See*—
Watson, James M., 4,105,506, Cl. 203-9.000.
Cotton, John F.: *See*—
Gogniat, Theodore; and Cotton, John F., 4,105,986, Cl. 337-3.000.
Cottrell, Ian W.; Empey, Richard A.; and Racciato, Joseph S., to Merck & Co., Inc. Sulfomethylated graft copolymers of xanthan gum and polyacrylamide. 4,105,605, Cl. 260-17.4GC.
Couture, Paul A.: *See*—
Anghinetti, Joseph R.; and Couture, Paul A., 4,104,834, Cl. 52-1.000.
Cowan, Arlis L. Dart game holder and score keeper. 4,105,119, Cl. 206-579.000.
Cowardin, Robert Lewis; and Laurer, George Joseph, to International Business Machines Corporation. Glitch filter circuit. 4,105,980, Cl. 328-165.000.
Cox, John T.: *See*—
Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,104,771, Cl. 29-25.140.
Cragoe, Edward J., Jr.: *See*—
Rooney, Clarence S.; Rokach, Joshua; and Cragoe, Edward J., Jr., 4,105,769, Cl. 424-263.000.
Creusot-Loire: *See*—
Bovagne, Rene, 4,105,067, Cl. 165-159.000.
Cronin, Michael Joseph, to Lockheed Aircraft Corporation. Electric power control system with load management programming. 4,106,013, Cl. 340-27.00R.
Crossfield, Roger J., to George A. Goulston Co., Ltd. Yarn finish formulation. 4,105,569, Cl. 252-8.600.
Crossley, Roger; and Hill, David George, to John Wyeth & Brother Limited. 4-Amido-2-alkoxy thiazoles and composition. 4,105,773, Cl. 424-270.000.
Crowley, Albert Timothy, to RCA Corporation. Pulse wave phase and frequency detector. 4,105,947, Cl. 331-1.00A.
CTS Corporation: *See*—
VanBenthuysen, John D.; Flanders, Thomas W.; and Gietzen, John R., 4,105,988, Cl. 338-132.000.
Culbertson, Charles H., to Westinghouse Electric Corp. Direct digital technique for generating an AC waveform. 4,105,939, Cl. 318-599.000.
Culmone, Vincent; and Kaniecki, Thaddeus J., to American Cyanamid Company. Process for formulating a non-caustic oven cleaner which will remove pyrolyzed fat efficaciously. 4,105,574, Cl. 252-154.000.
Culshaw, Brian, to National Research Development Corporation. Zener diodes. 4,106,043, Cl. 357-13.000.
Curran, Mike H. Bicycle reflector assembly. 4,105,286, Cl. 350-99.000.
Curtis, Fred J. Safety device. 4,105,190, Cl. 256-1.000.
Cushman, David W.: *See*—
Ondetti, Miguel Angel; and Cushman, David W., 4,105,776, Cl. 424-274.000.
Ondetti, Miguel Angel; and Cushman, David W., 4,105,789, Cl. 424-309.000.
Cushman, Donald Royal; Pagen, Charles Anthony; Schick, John William; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Asphalt composition and its manufacture. 4,105,612, Cl. 260-27.0EV.
Custro, Sergio: *See*—
Radici, Pierino; Custro, Sergio; Ermoni, Mario; and Colombo, Paolo, 4,105,638, Cl. 528-130.000.
Cutler-Hammer, Inc.: *See*—
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Czumak, Frank M.; and Stella, Joseph A., to Polaroid Corporation. Multipurpose film cassette having a processor disabling valve retention arrangement. 4,106,042, Cl. 354-317.000.
Dahlen, Theodore E.: *See*—
Wells, Thomas R.; and Dahlen, Theodore E., 4,105,312, Cl. 353-27.00R.
Daido Metal Company, Ltd.: *See*—
Mori, Sanae, 4,105,267, Cl. 308-240.000.
Daikin Kogyo Co., Ltd.: *See*—
Sakai, Shoji; and Okuda, Masahiro, 4,105,716, Cl. 260-884.000.
Daimler-Benz Aktiengesellschaft: *See*—
Amann, Rolf; Benda, Hans; and Dietterle, Albert, 4,105,230, Cl. 292-202.000.
Forster, Hans-Joachim; and Eltze, Ulrich, 4,105,101, Cl. 192-4.00A.
Fricker, Ludwig, 4,104,992, Cl. 123-32.0JV.
Geiger, Friedrich, 4,105,243, Cl. 296-28.00R.
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Dainippon Inc. & Chemicals Inc.: *See*—
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D'Amaddio, Eugene Raymond; and Enegess, David Norman, to Combustion Engineering, Inc. Liquid waste processing system. 4,105,556, Cl. 210-152.000.
Damsky, Arnold M. Electrical toggle switch lever extender. 4,105,884, Cl. 200-331.000.
Dana Corporation: *See*—
Kessmar, Leo R., 4,104,929, Cl. 74-473.00R.
Daneck, David A.: *See*—
Smeltzer, Paul; Sharma, Kris; Daneck, David A.; and McNally, Sellers B., 4,105,194, Cl. 267-64.00R.
Dany, Franz-Josef; Maier, Karl; Riedel, Tomas; and Wortmann, Joachim, to Hoechst Aktiengesellschaft. Process for flameproofing plastics. 4,105,735, Cl. 264-143.000.
Darboufas, Kimon Constantine: *See*—
Marshall, Robert Moore; and Darboufas, Kimon Constantine, 4,105,568, Cl. 252-8.600.
Dardi, Louis E.: *See*—
Veeck, Stewart J.; Freeman, William R.; and Dardi, Louis E., 4,104,782, Cl. 29-527.200.
Darnell, Alfred J.; and Parkins, William E., to Rockwell International Corporation. Hydrogen production. 4,105,755, Cl. 423-648.00R.
Darsie, Burns: *See*—
Trost, Wayne C.; and Darsie, Burns, 4,105,052, Cl. 139-101.000.
Das, Subodh K.: *See*—
Becker, Aaron J.; and Das, Subodh K., 4,105,752, Cl. 423-496.000.
Da Silva, Wilson Marcelo, to Cooperativa Central Dos Productores de Acucar e Alcool do Estado de Sao Paulo. Apparatus and method for treating sugar cane stumps. 4,105,893, Cl. 219-316.000.
Date, Kazuo H.; and Wainio, Ronald A., to McGraw-Edison Company. Vacuum interrupter and disconnect combination. 4,105,878, Cl. 200-146.00R.
Datta, Pabitra: *See*—
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Dave, Nalinkumar Jayantilal, to University of Salford. Constructional elements of concrete. 4,105,739, Cl. 264-256.000.
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Szejtli, Jozsef; Dosa, Eva; Tassonyi, Edomer; David, Agoston; and Nagy, Nee Zsuzsanna, 4,105,760, Cl. 424-180.000.
Davis, Kenneth G.; Due, George B.; and Lund, Albert H., to Mobil Oil Corporation. Storage stable water-dilutable epoxy based coating for metal food contact surfaces. 4,105,614, Cl. 260-29.40R.
Davis, Lewis Berkley, Jr.; and Wilkes, Colin, to General Electric Company. Fuel nozzle for gas turbines. 4,105,163, Cl. 239-406.000.
Davitt, Joseph J., to Ward Aero, Inc. Flow check valve with bias spring removal capability. 4,105,044, Cl. 137-517.000.
Day, Frederick A.; and Garbark, Melvin D., to Color Communications, Inc. Color sample display device. 4,104,809, Cl. 35-28.500.
Dearnaley, Geoffrey; and Hartley, Nicholas Edmund Whittam, to United Kingdom Atomic Energy Authority. Metal-forming dies. 4,105,443, Cl. 75-238.000.
Debenham, Michael; Dalli, Allan George; and Revell, Peter Louis, to Broken Hill Proprietary Company Limited, The. Pressure release closures. 4,105,134, Cl. 220-268.000.
Decker, Martin: *See*—
Dockner, Toni; Toussaint, Herbert; and Decker, Martin, 4,105,657, Cl. 260-239.00B.
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Deere & Company: *See*—
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Deffner, John F.; Wendel, Donald W.; and Barnes, Russell M., to Visual Marketing, Inc. Storage and dispensing rack. 4,105,126, Cl. 211-49.00D.
De Jong, Jan, to Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek. Method for the application of a spectral-selective coating on a plate. 4,105,822, Cl. 428-216.000.
Deknatel, Inc.: *See*—
Kurtz, Leonard D.; and Bidwell, Robert E., 4,105,031, Cl. 128-276.000.
Delgado, Manuel M. Method and apparatus for precision forming of

plastic materials such as glass to precise dimensions from sheet material. 4,105,429, Cl. 65-107.000.

Delignieres, Robert, to Institut Francais du Petrole. Acoustic wave transmitter-receiver. 4,105,991, Cl. 340-3.00D.

Del Toro, James J.; and Bussjager, Rudy C., to Carrier Corporation. Two stage compressor heating. 4,105,064, Cl. 165-29.000.

Demarest, Donald M.; and Leete, Bernard D., to General Electric Company. HVDC Floating current order system. 4,106,085, Cl. 363-51.000.

Demerson, Jean Robert. Roasting jack. 4,104,959, Cl. 99-421.00H.

Demura, Akira: *See*—
Murakami, Toshiaki; Waku, Shigeru; Demura, Akira; and Fujishiro, Toshiaki, 4,105,456, Cl. 106-46.000.

Denka Chemical Corporation: *See*—
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Denney, Jerry W., to American Motor Corporation. Urea assay. 4,105,408, Cl. 23-230.00B.

Denton, Douglas L.: *See*—
Shannon, Richard F.; and Denton, Douglas L., 4,105,623, Cl. 260-38.000.

Deraedt, Roger: *See*—
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de Ramaix, Maurice Antoine; and Somers, Aloijsius Gerardus, to AGFA-GEVAERT N.V. Electrodialysis cell and method for producing cationic permeable membranes used therein. 4,105,533, Cl. 204-301.000.

Desblache, Andre Eugene, to International Business Machines Corporation. Self-adaptive digital filter for noise and phase jitter reduction. 4,106,102, Cl. 364-724.000.

De Spiegeleer, Michel R., to Gestivalmo Societe Anonyme Holding. Railway switching points. 4,105,175, Cl. 246-430.000.

Dethloff, Jurgen. Identification system safeguarded against misuse. 4,105,156, Cl. 235-441.000.

De Thomas, Waldo; and Hort, Eugene Victor, to GAF Corporation. Production of gamma-butyrolactone from maleic anhydride with a hydrogenation catalyst. 4,105,674, Cl. 260-343.600.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Koberstein, Edgar; and Lakatos, Eduard, 4,105,590, Cl. 252-464.000.
Koch, Karlheinz; and Rupilius, Wolfgang, 4,105,430, Cl. 71-59.000.
Osswald, Gunter; and Graf, Hans, 4,105,464, Cl. 106-307.000.

De Wald, Horace A., to Parke, Davis & Company. 1,3,8-Trimethylimidazopyrazolodiazepine compounds. 4,105,851, Cl. 548-324.000.

Dewar, Robert: *See*—
Rossol, Lothar; Olsztyn, Joseph T.; Dewar, Robert; and Holland, Steven W., 4,105,925, Cl. 250-561.000.

Dexter Corporation, The: *See*—
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Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof. 4,105,786, Cl. 424-303.000.

Diamond Shamrock Corporation: *See*—
Paudler, William W.; Moser, Robert E.; and Pollack, Norman M., 4,105,434, Cl. 71-93.000.
Pohto, Gerald R., 4,105,529, Cl. 204-267.000.

Dichter, Michael: *See*—
Horowitz, Carl; Dichter, Michael; and Mangaraj, Duryodhan, 4,105,811, Cl. 427-302.000.

Dick, George Wilmer, to Bell Telephone Laboratories, Incorporated. Single substrate ac plasma display. 4,106,009, Cl. 340-343.000.

Dickert, Joseph J., Jr.: *See*—
Stournas, Stamoulis; and Dickert, Joseph J., Jr., 4,105,570, Cl. 252-8.55D.

Dickinson, John D., to Westinghouse Electric Corp. Control system for pressurized lubricating system. 4,105,093, Cl. 184-6.110.

Dielectric Systems International, Inc.: *See*—
Peck, David B., 4,105,294, Cl. 350-269.000.

Dieterich, Dieter; and Markusch, Peter, to Bayer Aktiengesellschaft. Highly filled polyurea foams. 4,105,594, Cl. 521-100.000.

Dietterle, Albert: *See*—
Amann, Rolf; Benda, Hans; and Dietterle, Albert, 4,105,230, Cl. 292-202.000.

Dilworth, James L.: *See*—
Kircher, Everett F.; and Dilworth, James L., 4,105,161, Cl. 239-2.00S.

Dingwall, Andrew Gordon Francis, to RCA Corporation. Voltage controlled oscillator (VCO) employing nested oscillating loops. 4,105,950, Cl. 331-57.000.

Director of National Research Institute of Tea: *See*—
Okada, Fumio, 4,105,784, Cl. 424-283.000.

Disch, Gunther; and Noormets, Elmar, to J. Aichelin KG. Continuous production furnace to heat ring-shaped workpieces. 4,105,398, Cl. 432-121.000.

Dixon, Daniel Allen; and Eigenbrode, George Thomas, to Du Pont de Nemours, E. I., and Company. Header with integral latch members. 4,105,275, Cl. 339-91.00R.

Dobranis, Aurel, to J. u. W. Muller, Maschinen-und Armaturenfabrik GmbH. Brushless welding generator. 4,105,963, Cl. 322-48.000.

Dockner, Toni; Toussaint, Herbert; and Decker, Martin, to BASF Aktiengesellschaft. Production of N-alkyl derivatives of cyclic alkylenimines. 4,105,657, Cl. 260-239.00B.

Dodd, Alec George, to Rolls-Royce Limited. Vane for a gas turbine engine having means for impingement cooling thereof. 4,105,364, Cl. 416-97.00R.

Doeg, Ralph W. Car mirror with U-shaped slot means and solenoid control. 4,105,301, Cl. 350-289.000.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Coated edible product and process for making same. 4,105,801, Cl. 426-99.000.

Domnick Hunter Engineers Limited: *See*—
Domnick, Keith Raphael, 4,105,561, Cl. 210-232.000.

Domnick, Keith Raphael, to Domnick Hunter Engineers Limited. Directional filter. 4,105,561, Cl. 210-232.000.

Donovan, Francis M., Jr. Heart pump. 4,105,016, Cl. 128-1.00D.

Doring Labels, Inc.: *See*—
Pingeton, Charles, 4,104,816, Cl. 40-2.00R.

Dormer, Leslie; and Nuttall, Roy, to Ferranti Limited. Semiconductor devices. 4,106,051, Cl. 357-71.000.

Dorr-Oliver Incorporated: *See*—
Kosonen, Vaino J., 4,105,563, Cl. 210-383.000.

Dosa, Eva: *See*—
Szejtli, Jozsef; Dosa, Eva; Tassonyi, Edomer; David, Agoston; and Nagy, Nee Zsuzsanna, 4,105,760, Cl. 424-180.000.

Dotson, Ronald L.: *See*—
Justice, David D.; Ahn, Byung K.; and Dotson, Ronald L., 4,105,514, Cl. 204-98.000.
Kuo, Han C.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 4,105,531, Cl. 204-290.00R.

Dow Chemical Company, The: *See*—
Evani, Syamalarao; and Corson, Frederick P., 4,105,649, Cl. 526-271.000.
Hay, Robert A., II, 4,105,026, Cl. 128-142.400.
Mullin, Charles R.; and Perettie, Donald J., 4,105,702, Cl. 260-658.00R.
Settineri, William J.; and Tolly, Milton C., 4,105,841, Cl. 526-62.000.
Swart, Daniel J.; and Kelyman, Jacqueline S., 4,105,633, Cl. 528-176.000.
Wagner, Eugene R.; and Matthews, Donald P., 4,105,791, Cl. 424-310.000.
Zachary, Richard E., 4,104,905, Cl. 73-40.000.

Dow Corning Corporation: *See*—
Clark, William H.; and Skinner, Charles E., 4,105,617, Cl. 260-31.20N.

Draganov, Nedelcho Draganov: *See*—
Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.

Draloric Electronic GmbH: *See*—
Baumann, Georg; and Hoffmann, Helmut, 4,106,075, Cl. 361-320.000.

Drechsel, Erhart Karl; and Sardisco, John B., to Pennzoil Company. Method of producing phosphoric acid and potassium dihydrogen phosphate from phosphate rock in the substantial absence of fluorine evolution. 4,105,748, Cl. 423-320.000.

Drell, William; and Pollard, John Kingsley, Jr., to Calbiochem-Behring Corp. Process of mitigating cholelithiasis. 4,105,794, Cl. 424-317.000.

Dresser Industries, Inc.: *See*—
Sorensen, Robert Keith; and Rallis, Anthony T. (said Robert Keith Sorensen assors. to), 4,105,263, Cl. 308-8.200.

Drew Chemical Corporation: *See*—
Sexsmith, David R., 4,105,581, Cl. 252-389.00A.

Driscoll, John S.; Marquez, Victor E.; and Peng, Geoffrey, to United States of America, State. Hydantoin compounds and methods of use thereof. 4,105,774, Cl. 424-273.00R.

Drori, Mordeki. Regulated flow-reducing device particularly useful for drip irrigation. 4,105,162, Cl. 239-109.000.

Drury, Lynn F., to Wilkinson, John Eaton. Illuminated drum stick, baton. 4,106,079, Cl. 362-34.000.

Duchild, Robert H.: *See*—
Smith, William R.; and Duchild, Robert H., 4,105,177, Cl. 248-15.000.

Due, George B.: *See*—
Davis, Kenneth G.; Due, George B.; and Lund, Albert H., 4,105,614, Cl. 260-29.40R.

Duff, Edward John: *See*—
Schreiber, Ronald Stanley; and Duff, Edward John, 4,105,759, Cl. 424-52.000.

Dukas, Sander G., to Timex Corporation. Adjustable expansion band for wristwatch. 4,104,872, Cl. 59-79.00R.

Dumont, Michel Paul; and Lamy, Jacques Edouard, to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris". Float for use in laying submarine pipelines. 4,104,886, Cl. 61-112.000.

Dunahoo, Edmond O., to Fiber Science, Inc. Multi-chambered cellular structure. 4,105,817, Cl. 428-188.000.

Dunigan, Opal. Bird cage with transparent shield. 4,104,986, Cl. 119-17.000.

Dunlop Limited: *See*—
Corner, Michael Raymond; and Jackson, William Lewis, 4,105,254, Cl. 301-63.0DS.
Lees, Geoffrey; Williams, Arthur Roger; and Bond, Robert, 4,105,458, Cl. 106-97.000.

Dunn, Ralph L., to United States of America, Army. Radar set sensitive to target shape. 4,106,014, Cl. 343-5.0SA.

Dupont, Bernard: *See*—
Brouard, Claude Marie Henri Emile; Dupont, Bernard; Leroy, Jean-Marie Louis; and Stiot, Jean-Pierre Henri, 4,105,653, Cl. 260-158.000.

Du Pont de Nemours, E. I., and Company: *See*—
Baker, Richard Anson; Forsythe, George Daniel; Likhyani, Kewal Krishan; Roberts, Robert Earl; and Robertson, David Charles, 4,105,548, Cl. 210-23.00H.
Dixon, Daniel Allen; and Eigenbrode, George Thomas, 4,105,275, Cl. 339-91.00R.
Gorondy, Emery John, 4,105,572, Cl. 252-62.10P.
Iler, Ralph Kingsley; and Kirkland, Joseph Jack, 4,105,426, Cl. 65-18.000.
Levy, Stanley Burton; and Garlington, William Drake, 4,104,769, Cl. 26-92.000.
Massey, William Moore, Jr.; and Sandukas, Theodos, 4,104,770, Cl. 28-257.000.

Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, to Smith Kline & French Laboratories Limited. Heterocyclomethylsulphinylethyl derivatives of N-cyanoguanidines, thioureas and 2-amino-1-nitroethylene. 4,105,770, Cl. 424-263.000.

Durkoppwerke GmbH: *See*—
Pollmeier, Konrad; and Hannemann, Franz, 4,104,977, Cl. 112-121.260.

Dwyer, John R. Method and apparatus for displaying bread in supermarkets. 4,104,973, Cl. 108-59.000.

Dyal, Marjorie M. Kit for drafting garment patterns. 4,104,800, Cl. 33-17.00R.

Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Auer, Peter; Kluge, Fritz; Lieske, Helmut; and Wutzler, Horst, 4,105,382, Cl. 425-88.000.

Dye, Richard: *See*—
Flood, John Michael; Messervey, Clifford Harry; Dye, Richard; and O'Connor, Leo Patrick, 4,105,122, Cl. 209-73.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Petersen, Egon Norbert, 4,105,628, Cl. 260-45.85R.

Dyroff, David R.; and Suchanek, Walton F., Jr., to Monsanto Company. Inhibition of dental calculus. 4,105,756, Cl. 424-48.000.

E.D.M. Co., Ltd.: *See*—
Abe, Moriaki, 4,104,965, Cl. 101-25.000.

E. R. Squibb & Sons, Inc.: *See*—
Ondetti, Miguel Angel; and Cushman, David W., 4,105,776, Cl. 424-274.000.
Ondetti, Miguel Angel; and Cushman, David W., 4,105,789, Cl. 424-309.000.

Eagle, Fred. Adjustable threshold. 4,104,830, Cl. 49-468.000.

Eastman Kodak Company: *See*—
Fox, Charles J., 4,105,447, Cl. 96-1.600.
Seil, Kenneth F., 4,105,324, Cl. 355-14.000.
Smith, James George; and Reed, Ralph Clyde, 4,105,451, Cl. 96-66.00T.
Wang, Richard H. S.; and Irick, Gether, Jr., 4,105,631, Cl. 260-45.80A.
Weemes, Doyle A.; and McConnell, Richard L., 4,105,718, Cl. 260-889.000.
Williams, Robert Franklin, Jr.; and Lu, Chen-i, 4,105,118, Cl. 206-524.200.

Eastman Technology, Inc.: *See*—
Jeffers, Frederick John; McClure, Richard John; and Lemke, James Underwood, 4,106,028, Cl. 346-74.100.

Eaton Corporation: *See*—
Vandervoort, John R., 4,104,928, Cl. 74-331.000.

Ebara Infilco Kabushiki Kaisha: *See*—
Kakumoto, Yoshiaki; Kanegawa, Mamoru; Iwaizumi, Takashi; and Matsumoto, Nobuo, 4,105,549, Cl. 210-33.000.

Ebauches Electroniques S.A.: *See*—
Chappatte, Jean-Maurice, 4,104,866, Cl. 58-85.500.

Eberhart, Ray. Latch mechanism. 4,105,234, Cl. 292-302.000.

Eby, Ralph H., to Skinner Irrigation Co. Flow control valve. 4,105,186, Cl. 251-35.000.

Eckler, Paul Eugene, to IMC Chemical Group, Inc. Partial resolution of pentaerythritol waste liquors. 4,105,575, Cl. 252-182.000.

Ecodyne Corporation: *See*—
Chirico, Anthony Nicholas, 4,105,065, Cl. 165-78.000.

Economics Laboratory, Inc.: *See*—
Mizuno, William G., 4,105,813, Cl. 428-76.000.

Edison Giocattoli S.p.A.: *See*—
Ferri, Giampiero, 4,104,819, Cl. 42-58.000.

Edward Shanbrom, Inc.: *See*—
Shanbrom, Edward; and Bishop, Robert C., 4,105,650, Cl. 260-112.00B.

Edwards, Roderick I.; and Nattrass, Michael J., to National Institute for Metallurgy, The. Separation and purification of platinum and palladium. 4,105,742, Cl. 423-22.000.

Edwards, Roderick I.: *See*—
Fieberg, Monika M.; and Edwards, Roderick I., 4,105,442, Cl. 75-101.0BE.

Egger, Friedrich: *See*—
Manser, Josef; and Egger, Friedrich, 4,104,958, Cl. 99-355.000.

Eggert, Frank, to Schlegel GmbH. Profile strip of U-shaped cross-section, in particular an edge protection strip for automobile. 4,105,814, Cl. 428-122.000.

Ehlinger, Robert Bruce, to General Electric Company. Process for the production of dihydrooxadiazinone compounds. 4,105,848, Cl. 544-68.000.

Eibeck, Richard E.: *See*—
Sweeney, Richard F.; Peterson, James O.; Sukornick, Bernard; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,105,691, Cl. 260-530.00R.

Eifel, Paul J.: *See*—
Schultz, Jeffrey A.; and Eifel, Paul J., 4,104,783, Cl. 29-451.000.

Eigenbrode, George Thomas: *See*—
Dixon, Daniel Allen; and Eigenbrode, George Thomas, 4,105,275, Cl. 339-91.00R.

Eiro, Seiji: *See*—
Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; Takeda, Tetuo; and Eiro, Seiji, 4,105,474, Cl. 148-12.00F.

Eisele, Judith A.; and Bauer, Donald J., to United States of America, Interior. Method for dehydrating metal chlorides. 4,105,747, Cl. 423-263.000.

Eisenmann, Karl Heinz; and Broch, Karl Heinz, to Bayer Aktiengesellschaft. Process for the production of highly elastic polyurethane foams. 4,105,595, Cl. 521-159.000.

Eisenschmid, Wolfgang: *See*—
Buckl, Hans; Brenner, Bernd; and Eisenschmid, Wolfgang, 4,105,467, Cl. 127-37.000.

Ekberg, Ove Leonard: *See*—
Ekberg, Sven Erik; and Ekberg, Ove Leonard, 4,105,227, Cl. 285-412.000.

Ekberg, Sven Erik; and Ekberg, Ove Leonard. Flange joint between pipe lengths. 4,105,227, Cl. 285-412.000.

Ekholm, Rolf, to AB Hammars Mekaniska Verkstad. Feeding device for guiding pieces of lumber to the one or the other of two longitudinal conveyors. 4,105,107, Cl. 198-358.000.

El Paso Products Company: *See*—
Newton, Cecil A., 4,105,856, Cl. 560-191.000.

Eleanor & Wilson Greatbatch Foundation: *See*—
Greatbatch, Wilson; Mead, Ralph T.; McLean, Robert L.; Rudolph, Frank W.; and Frenz, Norbert W., 4,105,833, Cl. 429-104.000.

Electro-Biology, Inc.: *See*—
Ryaby, John P.; and Pilla, Arthur A., 4,105,017, Cl. 128-1.500.

Electro Switch Corp.: *See*—
MacLean, Alexander, 4,106,072, Cl. 361-156.000.

Electro-Therm, Inc.: *See*—
Kennedy, James E., 4,105,895, Cl. 219-326.000.

Electronic Data Systems, Inc.: *See*—
Yarbrough, Grover A., 4,106,095, Cl. 364-464.000.

Elger, Walter: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,105,792, Cl. 424-313.000.

Elias, Abram G.; and Elias, Peter G. Document hanging system. 4,105,268, Cl. 312-184.000.

Elias, Peter G.: *See*—
Elias, Abram G.; and Elias, Peter G., 4,105,268, Cl. 312-184.000.

ELITEX, koncern textilniho strojirenstvi: *See*—
Fajfr, Vaclav, 4,105,053, Cl. 139-435.000.

Elliott, Kenneth A., to Raymond Lee Organization, Inc., The. Lockable hook asembly for perforated board. 4,105,179, Cl. 248-221.200.

Elliott, Kenneth D.: *See*—
Elliott, Peter F.; and Elliott, Kenneth D., 4,106,099, Cl. 364-510.000.

Elliott, Peter F.; and Elliott, Kenneth D. Refinery and pipeline monitoring system. 4,106,099, Cl. 364-510.000.

Elmer, Thomas H., to Corning Glass Works. Process for dewatering porous glass. 4,105,427, Cl. 65-30.00R.

Elna, GmbH: *See*—
Senger, Hans-Jurgen, 4,105,912, Cl. 315-10.000.

Eltze, Ulrich: *See*—
Forster, Hans-Joachim; and Eltze, Ulrich, 4,105,101, Cl. 192-4.00A.

Eltzroth, James L. Crane conversion method. 4,105,151, Cl. 228-170.000.

Elward, John R., to Fibreboard Corporation. Asparagus container. 4,105,152, Cl. 229-23.0BT.

Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, to Siemens Aktiengesellschaft. Electronic telephone system featuring a customer memory within a central control unit connected by bus lines. 4,105,871, Cl. 179-18.0AD.

Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, to Siemens Aktiengesellschaft. Centrally controlled electronic telephone system having a customer memory for storing information on two or more different subscriber stations and peripheral equipment-specific information. 4,105,874, Cl. 179-18.0AD.

Empey, Richard A.: *See*—
Cottrell, Ian W.; Empey, Richard A.; and Racciato, Joseph S., 4,105,605, Cl. 260-17.4GC.

Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, to Nipki po Tzvetna Metalurgia. Electric system for electric extraction of non-ferrous metals from their solutions. 4,105,527, Cl. 204-228.000.

Endoh, Takeyuki: *See*—
Okada, Kunihiro; Itatsuda, Yoshiharu; Endoh, Takeyuki; Yabuuchi, Shigeru; and Yokozawa, Norio, 4,106,100, Cl. 364-702.000.

Enegess, David Norman: *See*—
D'Amaddio, Eugene Raymond; and Enegess, David Norman, 4,105,556, Cl. 210-152.000.

Engle, Thomas H.; and Harris, John J., to General Signal Corporation. Electro-pneumatic apparatus for graduated brake release. 4,105,257, Cl. 303-15.000.

English Electric Valve Company Limited: *See—*
King, Robin Charles Moorhouse; and Esterson, Maurice, 4,105,911, Cl. 315-3.500.
Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, 4,105,951, Cl. 331-90.000.

Envirotech Corporation: *See—*
Fismer, William L., 4,105,560, Cl. 210-230.000.

Eplett, Fredrick R.: *See—*
Reedy, Wayne R.; and Eplett, Fredrick R., 4,104,888, Cl. 62-80.000.

Epoch Company, Ltd.: *See—*
Sakurai, Hiroshi, 4,106,008, Cl. 340-324.0AD.

Eprad Incorporated: *See—*
Boudouris, Angelo, 4,105,311, Cl. 352-187.000.

Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, to Ceskoslovenska akademie ved. Method of neutralizing industrial waste gases. 4,105,744, Cl. 423-239.000.

Erickson, Charles R.; Hingarh, Hemraj K.; Moeckel, Robert; and Wilnai, Dan, to Fairchild Camera and Instrument Corporation. Monolithic microcomputer central processor. 4,106,090, Cl. 364-200.000.

Eriksson, Hans Erik; and Florvall, Gosta Lennart, to Astra Lakemedel Aktiebolag. Hypotensive substituted 1,2,4-triazoles. 4,105,768, Cl. 424-263.000.

Ermoni, Mario: *See—*
Radici, Pierino; Custro, Sergio; Ermoni, Mario; and Colombo, Paolo, 4,105,638, Cl. 528-130.000.

Esner, Stanislav: *See—*
Mikulecky, Karel; Tyl, Miloslav; Janousek, Jan; Burysek, Frantisek; Skoda, Stanislav; and Esner, Stanislav, 4,104,854, Cl. 57-34.00R.

Esterson, Maurice: *See—*
King, Robin Charles Moorhouse; and Esterson, Maurice, 4,105,911, Cl. 315-3.500.

Etablissements Zelant, Gazuit: *See—*
Gazuit, Georges, 4,105,379, Cl. 425-47.000.

ETAT FRANCAIS rep by Del. Min pour l'Armement: *See—*
Guitton, Jacques; and Payn, Christian Jacques Maurice Charles Alexis, 4,105,835, Cl. 429-133.000.

Etchecopar, Arnaud: *See—*
Grassy, Robert; Apert, Dominique; and Etchecopar, Arnaud, 4,105,993, Cl. 340-15.5CP.

Ethicon, Inc.: *See—*
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,105,034, Cl. 128-335.500.

Etzlinger, Lucien: *See—*
Monnier, Denys; and Bolle, Pierre, 4,105,409, Cl. 23-232.00R.

Evani, Syamalarao; and Corson, Frederick P., to Dow Chemical Company, The. Aqueous polymeric thickening agents. 4,105,649, Cl. 526-271.000.

Evans, George S., to Westinghouse Electric Corp. Fluorescent lamp with an integral fail-safe and auxiliary-amalgam component. 4,105,910, Cl. 313-490.000.

Evans, Reginald David Owen: *See—*
Borst, Hans; Evans, Reginald David Owen; and Rand, John Arthur, 4,105,539, Cl. 208-33.000.

Extek Microsystems, Inc.: *See—*
Wallace, Charles E.; and Farmer, Donald J., 4,105,331, Cl. 355-103.000.

Extranuclear Laboratories, Inc.: *See—*
Siegel, Melvin W., 4,105,916, Cl. 250-282.000.

Exxon Research & Engineering Co.: *See—*
Halko, Richard A.; and Heigl, John J., 4,105,334, Cl. 356-104.000.
Lundberg, Robert D.; and Thame, Neville G., 4,104,824, Cl. 47-58.000.
Moser, William R., 4,105,589, Cl. 252-462.000.
O'Farrell, Charles P.; and Kresge, Edward N., 4,105,647, Cl. 526-33.000.
Patton, Tad L., 4,105,616, Cl. 521-62.000.
Say, Geoffrey R.; and Baird, William C., Jr., 4,105,704, Cl. 260-666.00P.
Shaub, Harold; and Waddey, Walter E., 4,105,571, Cl. 252-32.70E.
Venero, Agustin F., 4,105,829, Cl. 429-15.000.

Fahrenbach, Wolfgang B.: *See—*
Rockstead, Raymond H.; and Fahrenbach, Wolfgang B., 4,104,842, Cl. 52-650.000.

Fainman, Morton. Method for removing sludge from oil. 4,105,542, Cl. 208-180.000.

Fairaizl, Joseph H.: *See—*
Wasson, Joe R.; Pressley, Joseph R.; Baker, Robert W.; Fairaizl, Joseph H.; and Zorker, Richard J., 4,105,328, Cl. 355-78.000.

Fairchild Camera and Instrument Corporation: *See—*
Erickson, Charles R.; Hingarh, Hemraj K.; Moeckel, Robert; and Wilnai, Dan, 4,106,090, Cl. 364-200.000.

Fairchild Industries, Inc.: *See—*
Smallwood, John J., 4,105,047, Cl. 137-625.600.

Fairclough Construction Group Limited: *See—*
Thomas, Norman Stanley, 4,104,885, Cl. 61-45.00R.

Fajfr, Vaclav, to ELITEX, koncern textilniho strojirenstvi. Nozzle assembly for a hydraulic jet loom. 4,105,053, Cl. 139-435.000.

Fakira, Suleiman Mohammed: *See—*
Knox, Donald Edward; Fakira, Suleiman Mohammed; and Mitchell, Kenneth Andrew William, 4,105,114, Cl. 206-219.000.

Farkouh, Michel George Bazil: *See—*
Henehan, Padraig Anthony; and Farkouh, Michel George Bazil, 4,105,866, Cl. 179-6.00R.

Farler, Buist A.; and Vanderpool, Billy F. Multi-beam light switch. 4,105,898, Cl. 307-10.0LS.

Farmer, Donald J.: *See—*
Wallace, Charles E.; and Farmer, Donald J., 4,105,331, Cl. 355-103.000.

Farmery, Michael John: *See—*
Whittingham, Thomas Anthony; and Farmery, Michael John, 4,104,923, Cl. 73-646.000.

Farrell, John Francis; and Treichel, Hans Herbert, to Siemens Aktiengesellschaft. Electronic telephone system featuring periodic scanning of all peripheral units and polling of specific peripheral units for transmission of status and/or instruction information. 4,105,876, Cl. 179-18.0AD.

Farrell, John Francis: *See—*
Parise, James Louis; Schneider, Carl Michael; and Farrell, John Francis, 4,105,872, Cl. 179-18.0AD.
Schneider, Carl Michael; Schimmel, Frederick William; and Farrell, John Francis, 4,105,875, Cl. 179-18.0GF.

Fassbender, Charles J., to NCR Corporation. Random access memory system providing high-speed digital data output. 4,106,109, Cl. 365-238.000.

Faucci, Adriano: *See—*
Arni, Urs; Faucci, Adriano; and Stocker, August, 4,105,688, Cl. 260-465.80R.

Feinauer, Roland: *See—*
Rueter, Joern; Burzin, Klaus; Magosch, Karl-Heinz; and Feinauer, Roland, 4,105,672, Cl. 260-340.200.

Fenn, Gordon William, to Chrysler Corporation. Engine control system. 4,104,998, Cl. 123-117.00R.

Fenske, John W.: *See—*
Simons, John R.; and Fenske, John W., 4,105,076, Cl. 169-40.000.

Ferdinandi, Eckhardt: *See—*
Bagli, Jehan F.; and Ferdinandi, Eckhardt, 4,105,663, Cl. 544-379.000.

Ferranti Limited: *See—*
Dormer, Leslie; and Nuttall, Roy, 4,106,051, Cl. 357-71.000.

Ferri, Giampiero, to Edison Giocattoli S.p.A. Toy weapon. 4,104,819, Cl. 42-58.000.

Ferris, Donald Leroy; and Smith, George Arthur, to United Technologies Corporation. Helicopter rotor lead-lag damper. 4,105,365, Cl. 416-107.000.

Festinori, Volfango: *See—*
Raschke, Klaus; and Festinori, Volfango, 4,104,934, Cl. 81-57.380.

Fettinger, Paul I., to Garrett Corporation, The. Alternating current power dividing or combining system. 4,106,089, Cl. 363-153.000.

Fey, Maurice G., to Westinghouse Electric Corp. Arc heater apparatus for producing acetylene from heavy hydrocarbons. 4,105,888, Cl. 219-121.00P.

FIAT Societa per Azioni: *See—*
Husse, Massimo, 4,104,915, Cl. 73-194.00A.

Fiber Science, Inc.: *See—*
Dunahoo, Edmond O., 4,105,817, Cl. 428-188.000.

Fibreboard Corporation: *See—*
Elward, John R., 4,105,152, Cl. 229-23.0BT.

Fichtel & Sachs AG: *See—*
Axthammer, Ludwig, 4,105,041, Cl. 137-116.000.

Fieberg, Monika M.; and Edwards, Roderick I., to National Institute for Metallurgy, The. Separation and purification of ruthenium. 4,105,442, Cl. 75-101.0BE.

Fillmore, Richard Plumb: *See—*
Holbrook, Mark Denton; and Fillmore, Richard Plumb, 4,106,086, Cl. 363-60.000.

Finan, Michael Anthony: *See—*
Smith, Malcolm John; Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, 4,105,551, Cl. 210-58.000.

Fine, Robert H.: *See—*
Cease, James W., 4,104,902, Cl. 72-117.000.

Finlayson, Claude Malcolm; and Jordan, John W., to N L Industries, Inc. Organophilic clay having enhanced dispersibility. 4,105,578, Cl. 252-316.000.

Finley, William Solon, to Teledyne, Inc. Demultiplex and storage system for time division multiplexed frames of musical data. 4,104,950, Cl. 84-462.000.

Finney, Robert H., to Lord Corporation. Laminated bearing with plural modulus layer. 4,105,266, Cl. 308-237.00R.

Firmenich & Cie: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,105,661, Cl. 544-405.000.

Fischer, Hannes; and Werner, Gerhard, to Hoechst Aktiengesellschaft. Modified air-drying alkyd resins. 4,105,607, Cl. 260-22.0CB.

Fischer, Hanspeter: *See—*
Fory, Werner; and Fischer, Hanspeter, 4,105,685, Cl. 260-448.20N.

Fismer, William L., to Envirotech Corporation. Filter plate shifter. 4,105,560, Cl. 210-230.000.

Fitting, Robert C.; and Piesinger, Gregory H., to Motorola, Inc. Adaptive undesired signal canceller. 4,105,977, Cl. 325-472.000.

Flament, Ivon: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,105,661, Cl. 544-405.000.

Flanagan, Robert J., to General Electric Company. Pressure sensitive interrupter. 4,106,068, Cl. 361-15.000.

Flanders, Thomas W.: *See—*
VanBenthuysen, John D.; Flanders, Thomas W.; and Gietzen, John R., 4,105,988, Cl. 338-132.000.

Fleming, Ancel H. Tensioning linkage. 4,105,221, Cl. 280-461.00A.

Fleming-Brown, David Hugh: *See—*
Howard, John Arthur; Randall, Bryce Ernest; and Fleming-Brown, David Hugh, 4,104,853, Cl. 56-341.000.

Fletcher-Terry Company, The: *See—*
Insolio, Thomas A., 4,105,150, Cl. 225-96.500.

Flood, John Michael; Messervey, Clifford Harry; Dye, Richard; and O'Connor, Leo Patrick, to Borden, Inc. Inspecting cans for openings with light. 4,105,122, Cl. 209-73.000.

Florvall, Gosta Lennart: *See—*
Eriksson, Hans Erik; and Florvall, Gosta Lennart, 4,105,768, Cl. 424-263.000.

FMC Corporation: *See—*
Irving, Donald W.; and Chamberlin, Donald W., 4,105,123, Cl. 209-111.600.
Lotto, Ronald L., 4,105,489, Cl. 156-510.000.
Rosseau, Richard B., 4,104,760, Cl. 15-179.000.
Thomas, James L.; and Volpp, Gert P., 4,105,710, Cl. 260-869.000.

Foerster, Peter: *See—*
Boehlke, Klaus; Welz, Martin; Foerster, Peter; Sterzel, Hans-Josef; Wurmb, Rolf; and Matthies, Hans Georg, 4,105,624, Cl. 260-40.00R.

Fogt Industriemaschinenvertretung A.G.: *See—*
Calzolari, Sergio, 4,105,373, Cl. 417-317.000.

Fois, Battista. Lock safety device. 4,104,898, Cl. 70-419.000.

Foley, Kevin M.; Rastogi, Anil K.; and Rynd, Joseph P., to Owens-Corning Fiberglas Corporation. Treated glass fibers. 4,105,492, Cl. 156-629.000.

Foote, Francis C., to Addressograph Multigraph Corp. Apparatus for producing magnetically encoded articles. 4,106,062, Cl. 360-15.000.

Forbes, Hampton E., Jr., to Westvaco Corporation. Divided and tapered food carton. 4,105,155, Cl. 229-33.000.

Ford Motor Company: *See—*
Abdoo, Richard V., 4,104,991, Cl. 123-32.0EA.
Anderson, Arnold E.; and Weintraub, Marvin H., 4,105,473, Cl. 148-6.000.

Forss, Kaj G.; and Fuhrmann, Agneta G. M., to Keskuslaboratorio-Centrallaboratorium Ab. Adhesive for the manufacture of plywood, particle boards, fiber boards and similar products. 4,105,606, Cl. 260-17.500.

Forster, Hans-Joachim; and Eltze, Ulrich, to Daimler-Benz Aktiengesellschaft. Brake operated low ratio release. 4,105,101, Cl. 192-4.00A.

Forster, Helmut: *See—*
Hini, Paul; and Forster, Helmut, 4,105,012, Cl. 125-16.00R.

Forsythe, George Daniel: *See—*
Baker, Richard Anson; Forsythe, George Daniel; Likhyani, Kewal Krishan; Roberts, Robert Earl; and Robertson, David Charles, 4,105,548, Cl. 210-23.00H.

Fortmann, Hermann, to Olympia Werke AG. Device for the pressure fixing of toners. 4,104,963, Cl. 100-176.000.

Fortuna, Giorgio Della; and Zotteri, Luciano, to ANIC, S.p.A. Polycondensation thermoplastic elastomers composed by alternatingly arranged copolyesteramides. 4,105,640, Cl. 528-292.000.

Fory, Werner; and Fischer, Hanspeter, to Ciba-Geigy Corporation. Agent for the regulation of plant growth. 4,105,685, Cl. 260-448.20N.

Fotis, Peter, Jr.: *See—*
Hoff, Glen R.; Fotis, Peter, Jr.; and Boone, David E., 4,105,846, Cl. 526-124.000.

Fowler, William C.: *See—*
Rodebaugh, Helen D.; and Fowler, William C., 4,105,224, Cl. 281-15.00R.

Fowles, Richard G.: *See—*
Bothof, Delwin L.; Fowles, Richard G.; Heinzl, Johann J.; Novotny, David R.; Weisickle, Robert L.; Wetzel, John H.; and Winninghoff, Paul G., 4,105,995, Cl. 340-146.10E.

Fox, Charles J., to Eastman Kodak Company. Photoconductive insulating compositions including polyaryl hydrocarbon photoconductors. 4,105,447, Cl. 96-1.600.

Fox, Richard Q.; Millholen, James I.; and McWhirter, John H., to Westinghouse Electric Corp. Energy conservation control method. 4,106,097, Cl. 364-492.000.

Francesville Drain Tile Corporation: *See—*
Overmyer, Richard C.; and Guerra, Mario, 4,104,774, Cl. 29-234.000.

Francis, Ralph M., Jr., to Sta-Rite Industries. Liquid level sensing circuit. 4,105,367, Cl. 417-36.000.

Frank, Dieter: *See—*
Behnke, Joachim; Frank, Dieter; and Wallrabenstein, Michael, 4,105,620, Cl. 260-37.00N.

Fraser, Ian Duncan. Microfilm reading system. 4,105,315, Cl. 353-95.000.

Fratelli Marzoli & C. S.p.A.: *See—*
Grandi, Giorgio Adolfo, 4,104,857, Cl. 57-124.000.

Freedman, George; and Bowen, Robert F., to Raytheon Company. Microwave coffee maker. 4,104,957, Cl. 99-283.000.

Freedman, Gerald A. Tumbler lock. 4,104,897, Cl. 70-363.000.

Freeman, John Leslie, to Imperial Chemical Industries Limited. Manufacture of aromatic polymers containing ketone and sulphone groups. 4,105,635, Cl. 528-126.000.

Freeman, William R.: *See—*
Veeck, Stewart J.; Freeman, William R.; and Dardi, Louis E., 4,104,782, Cl. 29-527.200.

Freeport Minerals Company: *See—*
Wiewiorowski, Tadeusz Karol; and Thornsberry, Willis Lee, Jr., 4,105,741, Cl. 423-10.000.

Freisleben, Reinhard: *See—*
Soding, Bernward; and Freisleben, Reinhard, 4,105,316, Cl. 353-109.000.

Frensch, Heinz: *See—*
Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 4,105,775, Cl. 424-273.00R.

Frenz, Norbert W.: *See—*
Greatbatch, Wilson; Mead, Ralph T.; McLean, Robert L.; Rudolph, Frank W.; and Frenz, Norbert W., 4,105,833, Cl. 429-104.000.

Frey, William J.; and Meyer, Paul L., to Celanese Corporation. Snap-in fittings and coupling ring therefor. 4,105,226, Cl. 285-175.000.

Fricker, Ludwig, to Daimler-Benz Aktiengesellschaft. Injection installation for internal combustion engines. 4,104,992, Cl. 123-32.0JV.

Friedenberg, Robert M.; Yoscak, John L.; and Noren, Stephen E. Glucose level test apparatus. 4,105,522, Cl. 204-195.00B.

Friedman, Leonard: *See—*
Morgan, Thomas E., Jr., 4,104,961, Cl. 100-93.0PB.

Fritschi, Edgar: *See—*
Haake, Manfred; Pothmann, Reinhold; Ahrens, Kurt H.; and Fritschi, Edgar, 4,105,795, Cl. 424-320.000.

Frobenius, Wolf-Dietrich, to Robert Bosch GmbH. Process and apparatus for determining engine operation near the lean-running limit. 4,104,990, Cl. 123-32.0EA.

FRYMA-Maschinen AG: *See—*
Buhler, Gerhard, 4,105,066, Cl. 165-94.000.

Fuhrmann, Agneta G. M.: *See—*
Forss, Kaj G.; and Fuhrmann, Agneta G. M., 4,105,606, Cl. 260-17.500.

Fuji Photo Film Co., Ltd.: *See—*
Fukuda, Susumu, 4,106,039, Cl. 354-193.000.
Masuyama, Kenichi; Sugisaki, Tsutomu; Kitamoto, Tatsuji; and Yamada, Yasuyuki, 4,106,067, Cl. 360-137.000.
Miyatuka, Hajime; Saida, Takashi; and Honjo, Satoru, 4,105,448, Cl. 96-1.800.
Nakamura, Kotaro; Ichijima, Seiji; Furutachi, Nobuo; and Kosuge, Yosio, 4,105,656, Cl. 260-239.900.
Ogata, Yasuhiro; and Hibino, Noburo, 4,104,910, Cl. 73-141.00R.
Shiba, Keisuke; Aono, Toshiaki; Kubodera, Seiiti; Hirose, Takeshi; Ohi, Reiichi; and Shishido, Tadao, 4,105,452, Cl. 96-74.000.
Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,105,450, Cl. 96-33.000.
Tani, Tadaaki, 4,105,454, Cl. 96-122.000.

Fuji Xerox Co., Ltd.: *See—*
Pu, Lyong Sun, 4,105,446, Cl. 96-1.50R.

Fujie, Kunio: *See—*
Mishina, Haruo; Sunobe, Kazuhiro; and Fujie, Kunio, 4,105,372, Cl. 417-243.000.

Fujii, Hisashi: *See—*
Tachibana, Histaro; Fujii, Hisashi; and Sezaki, Tamotsu, 4,105,090, Cl. 181-265.000.

Fujikawa, Kanichi: *See—*
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, 4,105,435, Cl. 71-94.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,105,781, Cl. 424-283.000.

Fujishiro, Takeshi; Wazawa, Kiyoshi; and Oguro, Takeshi, to Nissan Motor Company, Ltd. Oxygen concentration sensor for heated gaseous mixture. 4,105,524, Cl. 204-195.00S.

Fujishiro, Toshiaki: *See—*
Murakami, Toshiaki; Waku, Shigeru; Demura, Akira; and Fujishiro, Toshiaki, 4,105,456, Cl. 106-46.000.

Fujita, Yoshiji; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, to Kuraray Company, Ltd. Process for preparing stereospecific nerolidol and ester thereof. 4,105,700, Cl. 568-875.000.

Fujitsu Limited: *See—*
Kudo, Ryosuke, 4,106,066, Cl. 360-133.000.
Yoshida, Masumi; Iwata, Kiyoshi; Yamamoto, Eiichiro; Masui, Takeshi; and Kabuyama, Yukikazu, 4,105,998, Cl. 340-146.3AC.

Fukuda, Susumu, to Fuji Photo Film Co., Ltd. Side-folding bellows element for folding camera. 4,106,039, Cl. 354-193.000.

Funk, Raymond E. Fuel distribution system. 4,105,003, Cl. 123-141.000.

Furda, Dymetro P., to International Telephone and Telegraph Corporation. Top mounted photoflash attachment for cameras with self-developing film. 4,106,077, Cl. 362-8.000.

Furness, John Douglas, to Hilti Aktiengesellschaft. Repair of bottle top molds. 4,104,777, Cl. 29-401.00D.

Furutachi, Nobuo: *See—*
Nakamura, Kotaro; Ichijima, Seiji; Furutachi, Nobuo; and Kosuge, Yosio, 4,105,656, Cl. 260-239.900.

Fushimi, Kenji: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; Shimizu, Toshihide; and Fushimi, Kenji, 4,105,839, Cl. 526-62.000.

G.A.O. Gesellschaft fur Automation und Organisation mbH: *See—*
Kaule, Wittich; and Stenzel, Gerhard, 4,105,333, Cl. 356-85.000.

G. D. Searle & Co.: *See—*
Hamilton, Robert W.; and Rorig, Kurt J., 4,105,849, Cl. 544-129.000.

Gaba, Rodolfo: *See—*
Kaplan, Stephen J.; and Gaba, Rodolfo, 4,105,562, Cl. 210-232.000.

Gaertner, Van R., to Monsanto Company. Cyclized derivatives of N-(2-hydroxyalkyl)-N-phosphonomethylglycine compounds. 4,105,432, Cl. 71-86.000.

GAF Corporation: *See—*
Chung, Rack H., 4,105,680, Cl. 260-378.000.

De Thomas, Waldo; and Hort, Eugene Victor, 4,105,674, Cl. 260-343.600.
Schneider, Louis; and Graham, David E., 4,105,671, Cl. 260-326.430.
Schneider, Louis; and Graham, David E., 4,105,797, Cl. 424-330.000.
Gall, Rudi: *See*—
Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased; Thiel, Max; and Vomel, Wolfgang, 4,105,772, Cl. 424-269.000.
Gallagher, James P., to Atlantic Richfield Company. C_9 alkyl benzene isomerization process. 4,105,706, Cl. 260-668A.
Ganellin, Charon Robin: *See*—
Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, 4,105,770, Cl. 424-263.000.
Garbark, Melvin D.: *See*—
Day, Frederick A.; and Garbark, Melvin D., 4,104,809, Cl. 35-28.500.
Garcea, Giampaolo, to Alfa Romeo S.p.A. Catalytic muffler for internal combustion engines. 4,105,414, Cl. 23-288.00F.
Gardena Kress & Kastner GmbH: *See*—
Lopic, Franc, 4,104,795, Cl. 30-272.00A.
Garlington, William Drake: *See*—
Levy, Stanley Burton; and Garlington, William Drake, 4,104,769, Cl. 26-92.000.
Garrett Corporation, The: *See*—
Fettinger, Paul I., 4,106,089, Cl. 363-153.000.
Garrett, William R.: *See*—
Compton, Robert N.; Reinhardt, Paul W.; and Garrett, William R., 4,105,746, Cl. 423-251.000.
Gasser, William J.; and Cooper, Richard H., to Brite-O-Matic Manufacturing, Inc. Machine for waxing vehicles. 4,104,756, Cl. 15-97.00B.
Gauthier, Michele: *See*—
Arod, Jean; Gauthier, Michele; and Platzer, Roger, 4,105,508, Cl. 204-1.00T.
Gautschi, Fritz: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,105,661, Cl. 544-405.000.
Gazuit, Georges, to Etablissements Zelant, Gazuit. Tire curing press. 4,105,379, Cl. 425-47.000.
Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik: *See*—
Hegenbart, Horst, 4,105,097, Cl. 187-8.750.
Gebr. Hofmann KG, Maschinenfabrik: *See*—
Brunnengraber, Hermann, 4,104,919, Cl. 73-462.000.
Gebrueder Buehler AG: *See*—
Manser, Josef; and Egger, Friedrich, 4,104,958, Cl. 99-355.000.
Geffcken, Walter; Krueger, Hans; and Walter, Karl-Heinz, to Siemens Aktiengesellschaft. Liquid crystal display with bistable cholesteric liquid crystal layer. 4,105,288, Cl. 350-350.000.
Geiger, Friedrich, to Daimler-Benz Aktiengesellschaft. Outer body panel structure for vehicle bodies. 4,105,243, Cl. 296-28.00R.
Geis, Heinz, to Adlerwerke vorm. Heinrich Kleyer A.G. Typewriter platen clutch mechanism. 4,105,106, Cl. 400-556.200.
Geislinger, Leonhard. Torsionally elastic mechanism. 4,104,891, Cl. 64-26.000.
Gelinas, Ralph J., to Grayson, Gross, Friedman, Phillips and Rasch; and Singer, Lewak, Greenbaum and Goldstein, by Ralph J. Gelinas, a part interest to each. Locking system for telescoping members. 4,105,346, Cl. 403-104.000.
General Electric Company: *See*—
Barcus, Victor D., 4,105,905, Cl. 310-59.000.
Bergt, Carl, 4,105,063, Cl. 165-21.000.
Boah, John K.; and Kennedy, Richard W., 4,104,786, Cl. 29-583.000.
Campbell, John R.; and Klopfer, Howard J., 4,105,857, Cl. 568-726.000.
Davis, Lewis Berkley, Jr.; and Wilkes, Colin, 4,105,163, Cl. 239-406.000.
Demarest, Donald M.; and Leete, Bernard D., 4,106,085, Cl. 363-51.000.
Ehlinger, Robert Bruce, 4,105,848, Cl. 544-68.000.
Flanagan, Robert J., 4,106,068, Cl. 361-15.000.
Harding, Thomas J.; and Hellman, Wayne R., 4,105,908, Cl. 313-217.000.
Heath, Darrell Richard; Holub, Fred Frank; and Wilkus, Edward Vincent, 4,105,825, Cl. 428-379.000.
Kindig, Alan L., 4,104,788, Cl. 29-596.000.
Lambert, Thomas W.; and Blake, James Edward, 4,105,922, Cl. 250-495.00T.
Pury, Thomas; Gray, Floyd L.; Sivertsen, Marvin L.; Konle, Robert L.; and Stehr, Richard E., 4,105,920, Cl. 250-402.000.
Roeder, Allan W.; and Kimball, Richard M., 4,106,017, Cl. 343-8.000.
Russell, Ronald R., 4,105,965, Cl. 324-28.0CB.
Sterling, Vaughn C.; and Schupp, Lewis J., 4,105,480, Cl. 149-40.000.
Sugalski, Raymond Kazimir, 4,105,832, Cl. 429-94.000.
Thomas, George L., 4,105,826, Cl. 428-379.000.
Timo, Dominic P.; Placek, Ronald J.; Gonyea, David C.; Johnson, Lloyd H.; and Kure-Jensen, Jens, 4,104,908, Cl. 73-117.300.
General Engineering and Mfg. Corporation: *See*—
Bell, Richard A.; Wallace, Earl C.; and Winters, Ted W., 4,104,747, Cl. 5-37.00R.
General Mills Fun Group, Inc.: *See*—
Brass, Robert L., 4,104,952, Cl. 85-5.00R.
General Motors Corporation: *See*—
Bell, Albert H., III; and Zeek, Richard M., 4,105,062, Cl. 165-9.000.
Brucken, Byron L.; and Watt, Roy E., 4,105,370, Cl. 417-222.000.
Buchwald, Robert M., 4,105,222, Cl. 280-668.000.
Calderoni, Sergio L., 4,104,943, Cl. 90-11.00C.
Graham, Donald E.; and Long, Paul J., Jr., 4,105,216, Cl. 280-6.00R.
Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., 4,104,787, Cl. 29-596.000.
Levijoki, Wayne A., 4,105,088, Cl. 180-108.000.
Long, Paul J., Jr., 4,105,193, Cl. 267-64.00R.
Nels, Terry E., 4,104,900, Cl. 72-70.000.
Nels, Terry E., 4,105,102, Cl. 192-106.100.
Rossol, Lothar; Olsztyn, Joseph T.; Dewar, Robert; and Holland, Steven W., 4,105,925, Cl. 250-561.000.
Savage, Jack W.; and Savage, Thomas J., 4,105,371, Cl. 417-238.000.
General Signal Corporation: *See*—
Engle, Thomas H.; and Harris, John J., 4,105,257, Cl. 303-15.000.
Genevski, Vladimir Vetov: *See*—
Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.
Gentaz, Claude; and Bienvenu, Gerard, to Battelle Memorial Institute. Process for reducing metal halides by reaction with calcium carbide. 4,105,440, Cl. 75-66.000.
Gentry, David R.: *See*—
Platt, Louis; Wishman, Marvin; Gentry, David R.; and Williams, Jake E., 4,105,381, Cl. 425-83.100.
Georg Fischer Aktiengesellschaft: *See*—
Hauke, Wilhelm, 4,105,060, Cl. 164-130.000.
Kopp, Hans, 4,105,255, Cl. 301-97.000.
George A. Goulston Co., Ltd.: *See*—
Crossfield, Roger J., 4,105,569, Cl. 252-8.600.
Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, to Hoffmann-La Roche Inc. Dibenz[b,f]oxepin derivatives. 4,105,664, Cl. 544-378.000.
Germain, Michel, to Commissariat a l'Energie Atomique. Method of preparation of trivalent plutonium formiate. 4,105,683, Cl. 260-429.100.
Gerson, Fred B. Positive locking device for boat trailer bolster bracket. 4,105,219, Cl. 280-789.000.
Geshner, Robert Andrew; and Mitchell, Joseph, Jr., to RCA Corporation. Method for removing defects from chromium and chromium oxide photomasks. 4,105,468, Cl. 134-3.000.
Gestivalmo Societe Anonyme Holding: *See*—
De Spiegeleer, Michel R., 4,105,175, Cl. 246-430.000.
GF Business Equipment, Inc.: *See*—
Hage, C. Herbert; Welch, Robert J.; and Goulish, Gabriel, 4,104,838, Cl. 52-239.000.
Gibert, Alain, to Societe Nationale des Petroles d'Aquitaine. Means for controlling the electric current density of a high tension direct current source. 4,106,084, Cl. 363-21.000.
Gibson, David Kent; Miller, Myrl J.; and Snell, Spencer Allan, to International Business Machines Corporation. Multiple reduction indicators for continuously variable reduction copier machines. 4,105,327, Cl. 355-59.000.
Gibson, Keith Hopkinson, to Imperial Chemical Industries Limited. Prostanoic acid derivatives. 4,105,854, Cl. 560-55.000.
Giesemann, Rolf: *See*—
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Reichl, Richard; and Giesemann, Rolf, 4,105,796, Cl. 424-330.000.
Gietzen, John R.: *See*—
VanBenthuysen, John D.; Flanders, Thomas W.; and Gietzen, John R., 4,105,988, Cl. 338-132.000.
Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Hanger adjustable end bearing assembly. 4,104,843, Cl. 52-693.000.
Gilbert, Russell L., to Caterpillar Tractor Co. Motor grader blade support with self-retaining wear strips. 4,105,078, Cl. 172-781.000.
Gillbrand, Per Sune; and Johansson, Anders Erik Bertil, to Saab-Scania Aktiebolag. Super-charged carburetor engine. 4,104,882, Cl. 60-600.000.
Gillette Company, The: *See*—
Chauvy, Jean-Daniel, 4,105,493, Cl. 156-644.000.
Gilmore, Jack Arthur: *See*—
Melanson, John Laurence; Springer, Richard Allen; Grimes, Jack Duane; and Gilmore, Jack Arthur, 4,106,011, Cl. 340-365.00E.
Gisiger, Ernst: *See*—
Hammer, Urs; and Gisiger, Ernst, 4,104,815, Cl. 38-77.500.
Glandon, James L.; and Hall, Stanley D., to W. R. Grace & Co. Method and apparatus for loading articles into containers. 4,104,847, Cl. 53-35.000.
Glaser, Milton A.: *See*—
Clope, Richard W.; and Glaser, Milton A., 4,105,613, Cl. 260-29.40R.
Glasrock Products, Inc.: *See*—
Midorikawa, Yoshio, 4,104,781, Cl. 29-419.00R.
Glasscock, Green Bateman, to Barcroft Company. Process for producing pharmaceutical grade aluminum hydroxide gels. 4,105,579, Cl. 252-317.000.
Gleave, Edward Roger, to Loctite (Ireland) Limited. Cyanoacrylate adhesive paste compositions. 4,105,715, Cl. 260-881.000.
Glendinning, William Bernard; and Mark, Albert, to United States of America, Army. Formation of metal nitride oxide semiconductor (MNOS) by ion implantation of oxygen through a silicon nitride layer. 4,105,805, Cl. 427-38.000.
Globe Industries Corporation: *See*—
Lin, Liang-Chuan, 4,105,483, Cl. 156-154.000.

Gloge, Detlef Christoph; Kaminow, Ivan Paul; and Presby, Herman Melvin, to Bell Telephone Laboratories, Incorporated. Compensation for material dispersion in optical fibers. 4,105,283, Cl. 350-96.310.
Gloriod, Pierre: *See*—
Machon, Jean-Pierre; Levresse, Bernard; and Gloriod, Pierre, 4,105,609, Cl. 260-23.00H.
Glotin, Bernard J. P.; and Guimard, Andre J., to Schlumberger Technology Corporation. Removable downhole measuring instruments with electrical connection to surface. 4,105,279, Cl. 339-117.00R.
Glover, Leon C.; and Lopez, Eugene F., to Raychem Corporation. Thermochromic paint for use on plastic substrates. 4,105,583, Cl. 252-408.000.
Glowacki Associates: *See*—
Glowacki, John J., 4,104,833, Cl. 51-281.00R.
Glowacki, John J., to Glowacki Associates. Grinding method. 4,104,833, Cl. 51-281.00R.
Godfrey, Alan: *See*—
Spence, Gordon; Hemmens, Cecil Godfrey; and Godfrey, Alan, 4,105,987, Cl. 338-130.000.
Goetz, Verena M. Foot cradle. 4,104,746, Cl. 5-327.00R.
Gogniat, Theodore; and Cotton, John F., to Westinghouse Electric Corp. Distribution transformer secondary circuit interrupter having an improved bimetal. 4,105,986, Cl. 337-3.000.
Goldman, Irving M.: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,105,661, Cl. 544-405.000.
Golias, Tipton, to Helena Laboratories Corporation. Clinical procedure for measuring lipoprotein cholesterols. 4,105,521, Cl. 204-180.00S.
Gonyea, David C.: *See*—
Timo, Dominic P.; Placek, Ronald J.; Gonyea, David C.; Johnson, Lloyd H.; and Kure-Jensen, Jens, 4,104,908, Cl. 73-117.300.
Goodman, Alvin Malcolm, to RCA Corporation. MIS readout device with dielectric storage medium. 4,106,107, Cl. 365-191.000.
Goodnight, Hershel E.; Reed, Robert D.; and Witwer, Alan D., to John Zink Company. Regenerative tile structure for fuel burners. 4,105,395, Cl. 431-351.000.
Goranson, Paul L.: *See*—
Harvey, Samuel E.; Whitehead, James Stephen; and Goranson, Paul L., 4,105,129, Cl. 214-152.000.
Gordon, Alan Mayer; Mazurek, Edward Francis; and Wright, Arden Bernard, to Bell Telephone Laboratories, Incorporated. Hazardous voltage protector for telephone line. 4,106,070, Cl. 361-42.000.
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Hanson, Harry T.; and Gordon, Marvin, 4,105,634, Cl. 526-65.000.
Gordy, Robert S.: *See*—
Sanders, David E.; Chambers, Ramon P.; and Gordy, Robert S., 4,105,975, Cl. 325-320.000.
Gore, Douglas Alan: *See*—
Clay, Burton Ross; and Gore, Douglas Alan, 4,105,915, Cl. 250-199.000.
Gorondy, Emery John, to Du Pont de Nemours, E. I., and Company. Ferromagnetic toner containing water-soluble or water-solubilizable resin(s). 4,105,572, Cl. 252-62.10P.
Goss, Gary J.; and Joyce, Thomas F., to Honeywell Information Systems Inc. Stretch and stall clock. 4,105,978, Cl. 328-58.000.
Gossage, Thomas M. Gin pole connector. 4,105,347, Cl. 403-157.000.
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Sano, Nobuya; Goto, Hiroshi; and Hirota, Yutaka, 4,105,945, Cl. 330-294.000.
Gottlieb, Steven. Process for the endothermic calcination of raw material. 4,105,460, Cl. 106-100.000.
Gottschlich, Alois; and Leverenz, Klaus, to Bayer Aktiengesellschaft. Phenyl-azo-anilino dyestuff. 4,105,655, Cl. 260-207.100.
Gould Inc.: *See*—
May, William E., 4,105,136, Cl. 220-339.000.
Goulish, Gabriel: *See*—
Hage, C. Herbert; Welch, Robert J.; and Goulish, Gabriel, 4,104,838, Cl. 52-239.000.
Graco Metal Products, Inc.: *See*—
Saint, David, 4,105,247, Cl. 297-149.000.
Graf, Hans: *See*—
Osswald, Gunter; and Graf, Hans, 4,105,464, Cl. 106-307.000.
Graf, John W., to Howmedica Inc. Lockable shipping box. 4,105,112, Cl. 206-1.500.
Graham, David E.: *See*—
Schneider, Louis; and Graham, David E., 4,105,671, Cl. 260-326.430.
Schneider, Louis; and Graham, David E., 4,105,797, Cl. 424-330.000.
Graham, Donald E.; and Long, Paul J., Jr., to General Motors Corporation. Motor vehicle level control circuit. 4,105,216, Cl. 280-6.00R.
Grandi, Giorgio Adolfo, to Fratelli Marzoli & C. S.p.A. Spinning and twisting device. 4,104,857, Cl. 57-124.000.
Grassy, Robert; Apert, Dominique; and Etchecopar, Arnaud, to Services et Instruments de Geophysique. Method for determining elastic constants of geological formations. 4,105,993, Cl. 340-15.5CP.
Gray, Floyd L.: *See*—
Pury, Thomas; Gray, Floyd L.; Sivertsen, Marvin L.; Konle, Robert L.; and Stehr, Richard E., 4,105,920, Cl. 250-402.000.
Grayson, Gross, Friedman, Phillips and Rasch: *See*—
Gelinas, Ralph J., 4,105,346, Cl. 403-104.000.
Greatbatch, Wilson; Mead, Ralph T.; McLean, Robert L.; Rudolph, Frank W.; and Frenz, Norbert W., to Eleanor & Wilson Greatbatch Foundation. Lithium-bromine cell. 4,105,833, Cl. 429-104.000.
Greber, Gerd: *See*—
Gruber, Urs; Greber, Gerd; and Kriemler, Hans-Peter, 4,105,648, Cl. 526-204.000.
Grecu, Nicolae: *See*—
Macoveanu, Aurelian Liviu Alexandru; and Grecu, Nicolae, 4,104,918, Cl. 73-379.000.
Greenleaf, James F.; and Johnson, Steven A., to University of Utah. Acoustic examination, material characterization and imaging of the internal structure of a body by measurement of the time-of-flight of acoustic energy therethrough. 4,105,018, Cl. 128-2.00V.
Griff, Gary J.: *See*—
Alexander, Thomas F.; and Griff, Gary J., 4,106,019, Cl. 343-9.000.
Grimes, Jack Duane: *See*—
Melanson, John Laurence; Springer, Richard Allen; Grimes, Jack Duane; and Gilmore, Jack Arthur, 4,106,011, Cl. 340-365.00E.
Grimm, Donald K.; Savold, Wayne A.; and Walter, Allen R., to Rockwell International Corporation. Ground speed deriving circuit. 4,106,093, Cl. 364-424.000.
Grone, Robert Joseph: *See*—
Kellermann, Arnold LeRoy; McDonald, David Ian; and Grone, Robert Joseph, 4,104,984, Cl. 118-2.000.
Gross, Arthur L., to Celanese Corporation. Multifunctional acrylates as foliar fungicides. 4,105,793, Cl. 424-314.000.
Gross, Lothar. Optical reading system for electronic pocket calculators. 4,105,287, Cl. 350-113.000.
Grossman, Claus H.: *See*—
Monnier, Denys; and Bolle, Pierre, 4,105,409, Cl. 23-232.00R.
Gruber, Urs; Greber, Gerd; and Kriemler, Hans-Peter, to Ciba-Geigy Corporation. Crosslinked polyacrylamides containing silyl groups. 4,105,648, Cl. 526-204.000.
Grunau Company Inc.: *See*—
Simons, John R.; and Fenske, John W., 4,105,076, Cl. 169-40.000.
Grundler, Anthony F., to Siesta Industries. Electrically adjustable bed frame. 4,104,749, Cl. 5-76.000.
Grundy, Paul L.: *See*—
Miller, Robert; and Grundy, Paul L., 4,106,076, Cl. 361-394.000.
GTE Sylvania Incorporated: *See*—
Burdick, Kenneth John; Constable, Douglas William; and Wheeler, Robert Charles, 4,106,055, Cl. 358-27.000.
Cosco, Robert J., 4,105,929, Cl. 315-125.000.
Sindlinger, Ronald E.; and Audesse, Emery G., 4,105,392, Cl. 431-95.00R.
Guelton, Claude: *See*—
Opron, Robert; Bourguignon, Philippe; and Guelton, Claude, 4,104,827, Cl. 49-385.000.
Guerra, Mario: *See*—
Overmyer, Richard C.; and Guerra, Mario, 4,104,774, Cl. 29-234.000.
Guidi, David M.: *See*—
Caccioli, Anthony; Carlson, Philip A.; and Guidi, David M., 4,104,776, Cl. 29-281.300.
Guillory, Henry. Audio distributor. 4,105,865, Cl. 179-1.00G.
Guimard, Andre J.: *See*—
Glotin, Bernard J. P.; and Guimard, Andre J., 4,105,279, Cl. 339-117.00R.
Guitton, Jacques; and Payn, Christian Jacques Maurice Charles Alexis, to ETAT FRANCAIS rep by Del. Min pour l'Armement. Solid-depolarizer electric cells. 4,105,835, Cl. 429-133.000.
Gulf Oil Canada Limited: *See*—
McQuitty, Stanley, 4,105,537, Cl. 208-11.0LE.
Gulf & Western Manufacturing Company: *See*—
Caccioli, Anthony; Carlson, Philip A.; and Guidi, David M., 4,104,776, Cl. 29-281.300.
Gunning, Samuel D., to Kent Air Tool Company. Air hammer with blow-out air system. 4,105,080, Cl. 173-66.000.
Gunther, Christian: *See*—
Zeidler, Gunter; and Gunther, Christian, 4,105,092, Cl. 184-6.400.
Gupalo, Jury Dmitrievich: *See*—
Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.
Gutcho, Sidney; McCarter, Henry; and Chanod, Edward, to Becton, Dickinson and Company. Receptor coated plastic for assay of ligands. 4,105,410, Cl. 23-253.0TP.
Guterman, Paulette: *See*—
Maillot, Jean, 4,106,000, Cl. 340-530.000.
Guyton, David L. Method for determining the refractive correction for an eye. 4,105,303, Cl. 351-39.000.
H. Goodman & Sons, Inc.: *See*—
Herzog, Milton W., 4,104,817, Cl. 40-19.500.
H. R. Electronics Company: *See*—
Levasseur, Joseph L.; and Seiter, William A., 4,105,867, Cl. 179-6.30R.
Haake, Manfred; Pothmann, Reinhold; Ahrens, Kurt H.; and Fritschi, Edgar, to Ludwig Heumann & Co. GmbH. Antispasmodic substituted sulphoximides. 4,105,795, Cl. 424-320.000.
Haar, Richard, to Volkswagenwerk Aktiengesellschaft. Shock absorbing body. 4,105,236, Cl. 293-71.00R.
Haarmann, Walter: *See*—
Kummer, Werner; Stahle, Helmut; Koppe, Herbert; Haarmann, Walter; and Reichl, Richard, 4,105,765, Cl. 424-248.560.
Haase, Donald A.; and Reed, Robert E., to Mobil Oil Corporation.

Process and apparatus for the manufacture of embossed film laminations. 4,105,491, Cl. 156-553.000.

Hage, C. Herbert; Welch, Robert J.; and Goulish, Gabriel, to GF Business Equipment, Inc. Portable wall assembly. 4,104,838, Cl. 52-239.000.

Hagenlocher, Walter; Neumann, Karl-Heinz; Muller, Martin; Kleebaur, Karl; Sokol, Gunter; and Molt, Jurgen, to Robert Bosch GmbH. Slip ring structure for dynamo electric machines, particularly automotive-type alternators. 4,105,907, Cl. 310-232.000.

Hahn, Hee Mok. Dial lock. 4,104,896, Cl. 70-310.000.

Haida, Hirotoshi: *See—*
Nitta, Atsushi; and Haida, Hirotoshi, 4,106,104, Cl. 364-900.000.

Haines, Kendrick Peter; and MacPherson, Roy Duncan, to Parel Societe Anonyme. Improvements in or relating to the electrowinning of metals. 4,105,532, Cl. 204-301.000.

Hajos, Zoltan George: *See—*
Parrish, David Richard; and Hajos, Zoltan George, 4,105,696, Cl. 260-586.00F.

Halbach & Braun: *See—*
Braun, Ernst; and Braun, Gert, 4,105,110, Cl. 198-731.000.

Halko, Richard A.; and Heigl, John J., to Exxon Research & Engineering Co. Optical detector. 4,105,334, Cl. 356-104.000.

Hall, Stanley D.: *See—*
Glandon, James L.; and Hall, Stanley D., 4,104,847, Cl. 53-35.000.

Halliburton Company: *See—*
Baker, Eugene E., 4,105,069, Cl. 166-51.000.

Hamada, Masa: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,105,658, Cl. 260-239.30T.

Hamerdinger, Randolph W.: *See—*
Wang, Shing Chung; and Hamerdinger, Randolph W., 4,105,954, Cl. 331-94.5PE.

Hamilton, Robert W.; and Rorig, Kurt J., to G. D. Searle & Co. [(Substituted)phenyl]phenylmethyl-1-(dialkylaminoalkyl)piperidines. 4,105,849, Cl. 544-129.000.

Hammer, Urs; and Gisiger, Ernst, to Jura Elektroapparate-Fabriken L. Henzirohs A.G. Steam iron. 4,104,815, Cl. 38-77.500.

Hampton, James Ronald: *See—*
Baron, David Alan; and Hampton, James Ronald, 4,105,886, Cl. 219-10.55E.

Hampton, Perry Dwaine; and Tobey, Jimmie Lee, to Recognition Equipment Incorporated. Ink jet printer ink heater. 4,106,030, Cl. 346-140.00R.

Hamzawi, Fawzi J., to Solitron Devices, Inc. Method of manufacturing semiconductors. 4,105,476, Cl. 148-187.000.

Hankin-Baker Limited: *See—*
Jackson, Kenneth Roy, 4,104,868, Cl. 52-743.000.

Hann, Paul D.: *See—*
Little, Donald M.; and Hann, Paul D., 4,105,707, Cl. 260-683.480.

Hannemann, Franz: *See—*
Pollmeier, Konrad; and Hannemann, Franz, 4,104,977, Cl. 112-121.260.

Hans Blomstedt Handelsbolag: *See—*
Blomstedt, Hans C. M., 4,105,032, Cl. 128-360.000.

Hanson, David Jack. Brick molding machine. 4,105,383, Cl. 425-96.000.

Hanson, Harry T.; and Gordon, Marvin, to Celanese Corporation. Production of thermosetting resinous polyepoxides. 4,105,634, Cl. 526-65.000.

Hansson, Hans-Erik, to Stal-Laval Turbin AB. Epicyclic gear trains. 4,104,932, Cl. 74-801.000.

Haralampiev, Georgi Alexandrov: *See—*
Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.

Hardin, Robert H., to Boeing Company, The. Frequency synthesizer apparatus. 4,105,949, Cl. 331-37.000.

Harding, Thomas J.; and Hellman, Wayne R., to General Electric Company. Metal halide lamp having open tungsten coil electrodes. 4,105,908, Cl. 313-217.000.

Hardt, Dietrich; Serini, Volker; Vernaleken, Hugo; and Braese, Hans-Eberhard, to Bayer Aktiengesellschaft. PVC moulding compounds with high dimensional stability to heat. 4,105,711, Cl. 260-873.000.

Hardwick, Thomas James: *See—*
Hardwick, Thomas Lee Richard; and Hardwick, Thomas James, 4,105,130, Cl. 214-314.000.

Hardwick, Thomas Lee Richard; and Hardwick, Thomas James. Receptacle transporting vehicle. 4,105,130, Cl. 214-314.000.

Hargis, David R.: *See—*
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Harizanov, Kiril Georgiev: *See—*
Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.

Harnisch, Horst, to Bayer Aktiengesellschaft. Monomethine dyestuffs. 4,105,665, Cl. 260-289.00C.

Harper, Robert J., Jr.: *See—*
Andrews, Bethlehem K.; Harper, Robert J., Jr.; and Cashen, Norton A., 4,105,403, Cl. 8-115.000.

Harris, Harold D., to Harris and Thrush Manufacturing Company. Method of harvesting and transporting grain. 4,104,850, Cl. 56-1.000.

Harris, John J.: *See—*
Engle, Thomas H.; and Harris, John J., 4,105,257, Cl. 303-15.000.

Harris and Thrush Manufacturing Company: *See—*
Harris, Harold D., 4,104,850, Cl. 56-1.000.

Harrison, Leslie Herbert Raymond, to Possum Controls Limited. Typewriter-calculator combination for the physically disabled. 4,106,101, Cl. 364-709.000.

Harsco Corporation: *See—*
Barnes, Thomas Malcolm, 4,105,439, Cl. 75-51.000.

Hartel, Gunter, to Pierburg GmbH & Co KG. Control mechanism for operation of an internal combustion engine. 4,105,001, Cl. 123-140.0CC.

Hartel, Kurt: *See—*
Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 4,105,775, Cl. 424-273.00R.

Hartley, Nicholas Edmund Whittam: *See—*
Dearnaley, Geoffrey; and Hartley, Nicholas Edmund Whittam, 4,105,443, Cl. 75-238.000.

Hartman, Robert J.: *See—*
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,105,597, Cl. 521-159.000.

Hartsough, Lloyd Bruce: *See—*
Adrion, David Martin; and Hartsough, Lloyd Bruce, 4,105,038, Cl. 132-7.000.

Haruna, Tohru: *See—*
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,105,629, Cl. 260-45.8NT.

Harvey, Samuel E.; Whitehead, James Stephen; and Goranson, Paul L., to Carrier Corporation. Method for unloading refuse containers. 4,105,129, Cl. 214-152.000.

Hascoe, Norman, to Semi-Alloys, Inc. Hermetically sealed container for semiconductor and other electronic devices. 4,105,861, Cl. 174-52.0FP.

Hasebe, Nobutoshi; Itoh, Toshiyuki; and Hashimoto, Takashi, to Hitachi, Ltd. Preheating and warming apparatus for use with vehicles. 4,105,158, Cl. 237-12.30C.

Hasebe, Shigeta, to Hosoda, Haruji. Apparatus for decomposition of aqueous liquid. 4,105,528, Cl. 204-237.000.

Hasegawa, Goro: *See—*
Nakamura, Zenzo; and Hasegawa, Goro, 4,106,037, Cl. 354-128.000.

Hasegawa, Hitoshi: *See—*
Hosono, Akira; Isogai, Yoshihisa; Hasegawa, Hitoshi; and Tanahashi, Toshio, 4,104,996, Cl. 123-90.430.

Hashimoto, Takashi: *See—*
Hasebe, Nobutoshi; Itoh, Toshiyuki; and Hashimoto, Takashi, 4,105,158, Cl. 237-12.30C.

Hasler, David John; and McGhee, Thomas Allan, to Wiggins Teape Limited. Microcapsules, method for their preparation, and sheet material carrying microcapsules. 4,105,823, Cl. 428-307.000.

Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, to Hoffmann-La Roche Inc. Substituted phenyl ketones. 4,105,852, Cl. 548-342.000.

Hastings, Jerome K.; and Piber, Earl T., to Cutler-Hammer, Inc. Electric switch having a frame with improved snap-in base retention means. 4,105,883, Cl. 200-296.000.

Haswell, John N. Method for collecting postpartum fluid loss. 4,105,019, Cl. 128-2.00F.

Hauke, Wilhelm, to Georg Fischer Aktiengesellschaft. Chill casting method and apparatus. 4,105,060, Cl. 164-130.000.

Hay, Robert A., II, to Dow Chemical Company, The. Bowless eyeglasses holder. 4,105,026, Cl. 128-142.400.

Hayakawa, Hayashi: *See—*
Nishino, Atsushi; Hayakawa, Hayashi; Yoshida, Akihiko; and Umeda, Junichiro, 4,105,513, Cl. 204-38.00A.

Hayashi, Izuo; and Lang, Roy, to Nippon Electric Co., Ltd. Heterostructure laser having a stripe region defined in an active layer by a difference in impurity. 4,105,955, Cl. 331-94.50H.

Hayes, Richard H.; McFarland, Lellan L.; Schrum, George L.; and Vanderzee, Robert S., to Akron Standard, Division of Eagle-Picher Industries, Inc. Raw edge V-belt building apparatus. 4,105,488, Cl. 156-425.000.

Heath, Darrell Richard; Holub, Fred Frank; and Wilkus, Edward Vincent, to General Electric Company. Polyolefin with phosphorylated novolac flame retardant, peroxide cured, as metallic insulator. 4,105,825, Cl. 428-379.000.

Hedberg, John Bengt Goran. Apparatus for igniting the match heads of electric detonators. 4,106,073, Cl. 361-248.000.

Heetderks, William J.: *See—*
Williams, William J.; and Heetderks, William J., 4,105,021, Cl. 128-2.05A.

Hegemann, Norbert R., to Allis-Chalmers Corporation. Transmission gear ratio indicator. 4,104,982, Cl. 116-124.00M.

Hegenbart, Horst, to Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik. Lift, especially two-post lift for motor vehicles. 4,105,097, Cl. 187-8.750.

Hehl, Karl. Compact die closing unit for injection molding machines. 4,105,385, Cl. 425-192.00R.

Hehl, Karl. Die closing unit with plate adjustment mechanism for injection molding machine. 4,105,390, Cl. 425-450.100.

Heigl, John J.: *See—*
Halko, Richard A.; and Heigl, John J., 4,105,334, Cl. 356-104.000.

Hein, Leopold A.: *See—*
Myers, William N.; and Hein, Leopold A., 4,105,261, Cl. 308-72.000.

Heinrich, Allan E., to Applied Power, Inc. Rotor for hydraulic pump or motor. 4,105,376, Cl. 418-77.000.

Heinrich, Hans J.; Koslowsky, Bernd; and Hoffmann, Egon. Apparatus for draining of muddy liquids. 4,105,558, Cl. 210-199.000.

Heintke, Hans-Eberhard: *See*—
Karey, Hans; Oberheim, Robert; and Heintke, Hans-Eberhard, 4,106,080, Cl. 362-18.000.

Heintz, Dennis Ronald; and Thelen, Arthur Bertram, to INRYCO, Inc. Metal building panel. 4,104,840, Cl. 52-309.900.

Heinzl, Johann J.: *See*—
Bothof, Delwin L.; Fowles, Richard G.; Heinzl, Johann J.; Novotny, David R.; Weisickle, Robert L.; Wetzel, John H.; and Winninghoff, Paul G., 4,105,995, Cl. 340-146.10E.

Helena Laboratories Corporation: *See*—
Golias, Tipton, 4,105,521, Cl. 204-180.00S.

Helix International Limited: *See*—
Payton, Raymond Anthony, 4,104,801, Cl. 33-27.00B.

Hell, Hans: *See*—
Thiel, Alfons W.; and Hell, Hans, 4,105,386, Cl. 425-217.000.

Hellgren, Keijo, to Asea Aktiebolag. Hydraulic press. 4,105,388, Cl. 425-389.000.

Hellman, Wayne R.: *See*—
Harding, Thomas J.; and Hellman, Wayne R., 4,105,908, Cl. 313-217.000.

Helmrich, Gunter; and Wulfing, Fritz, to Vereinigte Aluminium-Werke Aktiengesellschaft. Method of making shaped bodies. 4,105,729, Cl. 264-71.000.

Helmus, Sydney S., to Baker International Corporation. Test valve having automatic bypass for formation pressure. 4,105,075, Cl. 166-321.000.

Hemmens, Cecil Godfrey: *See*—
Spence, Gordon; Hemmens, Cecil Godfrey; and Godfrey, Alan, 4,105,987, Cl. 338-130.000.

Henderson, John Goodchilde Norie; and Wine, Charles Martin, to RCA Corporation. Phase locked loop television tuning system. 4,106,059, Cl. 358-191.000.

Hendrickson, Donald W.; and Howard, James S., to Hendrickson, Donald W. Integral flanged elastomeric flow restrictor. 4,105,050, Cl. 138-45.000.

Henehan, Padraig Anthony; and Farkouh, Michel George Bazil, to Ansafone Limited. Telephone answering machine busy signal detection devices with switching means. 4,105,866, Cl. 179-6.00R.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Koch, Karlheinz; and Rupilius, Wolfgang, 4,105,430, Cl. 71-59.000.
Wehle, Volker; and Reiffert, Jurgen, 4,105,405, Cl. 21-2.70R.

Henry, Paul Michael, to Motorola, Inc. Differential amplifier circuit having common mode compensation. 4,105,942, Cl. 330-261.000.

Henschke, Siegfried; and Lindberg, Albert, to Leybold-Heraeus GmbH & Co. KG. Plug assembly. 4,105,273, Cl. 339-47.00R.

Henthorn, Donald Ray: *See*—
Mendoza, Gregory E.; Henthorn, Donald Ray; and Taylor, James Franklin, 4,105,188, Cl. 254-10.500.

Hepworth, Edward C.; and Means, Rodney J., to Motorola, Inc. Interrupt status indication logic for polled interrupt digital system. 4,106,091, Cl. 364-200.000.

Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity: *See*—
McQuitty, Stanley, 4,105,537, Cl. 208-11.0LE.

Herb, Eugen; Petera, Theodor; and Bitzel, Hubert, to Trumpf Maschinen AG. Nibbling machine having automatically adjustable feed control. 4,104,940, Cl. 83-71.000.

Herbert Kannegiesser Kommanditgesellschaft: *See*—
Schuster, Wolfgang, 4,105,896, Cl. 219-470.000.

Hercules Incorporated: *See*—
Prosser, Thomas John, 4,105,837, Cl. 526-26.000.

Hershel, Ronald S., to University Patents, Inc. Apparatus and method for image sampling. 4,105,289, Cl. 350-162.0SF.

Hertel, Gunther: *See*—
Zimmermann, Heinz; and Martens, Wolfgang, 4,105,264, Cl. 308-20.000.

Hertel, Karl Gustav: *See*—
Zimmermann, Heinz; and Martens, Wolfgang, 4,105,264, Cl. 308-20.000.

Hertl, William; and Ramsey, William S., to Corning Glass Works. Anerobic specimen transport system. 4,105,498, Cl. 195-59.000.

Herzog, Donald George: *See*—
Reno, Charles William; and Herzog, Donald George, 4,105,926, Cl. 250-566.000.

Herzog, Milton W., to H. Goodman & Sons, Inc. Inventory-control merchandise display apparatus. 4,104,817, Cl. 40-19.500.

Hesselbo, Torben: *See*—
Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, 4,105,770, Cl. 424-263.000.

Hewlett-Packard Company: *See*—
Bothof, Delwin L.; Fowles, Richard G.; Heinzl, Johann J.; Novotny, David R.; Weisickle, Robert L.; Wetzel, John H.; and Winninghoff, Paul G., 4,105,995, Cl. 340-146.10E.

Hibino, Noburo: *See*—
Ogata, Yasuhiro; and Hibino, Noburo, 4,104,910, Cl. 73-141.00R.

Highley, John; and Vickers, Michael Alan, to Coal Industry (Patents) Limited. Fluidized bed apparatus. 4,105,419, Cl. 48-61.000.

Hill, Clifford W.; Carkhuff, Donald W.; and Pilia, Frank J., to Union Carbide Corporation. Metal-inert-gas welding torch. 4,105,891, Cl. 219-137.430.

Hill, David George: *See*—
Crossley, Roger; and Hill, David George, 4,105,773, Cl. 424-270.000.

Hill, James A.; and Hargis, David R., to Tektronix, Inc. Knockdown stand for electronic instrument. 4,105,176, Cl. 248-13.000.

Hillenbrand, Louis J.: *See*—
Schwerzel, Robert E.; Klosterman, Nancy E.; Kelly, John Robert; and Hillenbrand, Louis J., 4,105,014, Cl. 126-270.000.

Hilti Aktiengesellschaft: *See*—
Furness, John Douglas, 4,104,777, Cl. 29-401.00D.

Hilton, Richie Conrad. Photo printing apparatus. 4,105,330, Cl. 355-102.000.

Himmele, Walter; Hupfer, Leopold; Toussaint, Herbert; and Paul, Gerhard, to BASF Aktiengesellschaft. Manufacture of 2-amino-1-alcohols. 4,105,669, Cl. 260-307.00F.

Hindrichs, Gerhard. Pipe installing apparatus for large heat exchangers. 4,104,790, Cl. 29-707.000.

Hines, Robin H.: *See*—
Hohne, Walter; and Hines, Robin H., 4,105,332, Cl. 356-5.000.

Hingarh, Hemraj K.: *See*—
Erickson, Charles R.; Hingarh, Hemraj K.; Moeckel, Robert; and Wilnai, Dan, 4,106,090, Cl. 364-200.000.

Hini, Paul; and Forster, Helmut, to Siemens Aktiengesellschaft. Apparatus for cutting up hard and brittle material. 4,105,012, Cl. 125-16.00R.

Hinkel, Holger, to International Business Machines Corporation. Apparatus for making a rastered photoconductive layer. 4,105,924, Cl. 250-492.00A.

Hirasawa, Kunio: *See*—
Tsukushi, Masanori; Kashimura, Katsuichi; Hirasawa, Kunio; and Yoshioka, Yoshio, 4,105,879, Cl. 200-148.00A.

Hirata, Hiroshi; and Kondo, Takashi, to Minolta Camera Kabushiki Kaisha. Indicating device for motion picture camera. 4,105,310, Cl. 352-171.000.

Hirose, Takeshi: *See*—
Shiba, Keisuke; Aono, Toshiaki; Kubodera, Seiiti; Hirose, Takeshi; Ohi, Reiichi; and Shishido, Tadao, 4,105,452, Cl. 96-74.000.

Hirota, Yutaka: *See*—
Sano, Nobuya; Goto, Hiroshi; and Hirota, Yutaka, 4,105,945, Cl. 330-294.000.

Hitachi Construction Machinery Co., Ltd.: *See*—
Ono, Kozo; and Kato, Taketoshi, 4,104,956, Cl. 91-491.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Okada, Kunihiro; Itatsuda, Yoshiharu; Endoh, Takeyuki; Yabuuchi, Shigeru; and Yokozawa, Norio, 4,106,100, Cl. 364-702.000.

Hitachi, Ltd.: *See*—
Hasebe, Nobutoshi; Itoh, Toshiyuki; and Hashimoto, Takashi, 4,105,158, Cl. 237-12.30C.
Hohsho, Yukio; Karino, Kimiji; Momono, Masakichi; Oyama, Yoshishige; Yamauchi, Teruo; and Teranishi, Takao, 4,105,720, Cl. 261-34.00A.
Inoue, Fumio, 4,105,933, Cl. 315-387.000.
Mishina, Haruo; Sunobe, Kazuhiro; and Fujie, Kunio, 4,105,372, Cl. 417-243.000.
Naka, Reishi; and Narahara, Toshikazu, 4,105,599, Cl. 521-131.000.
Okada, Kunihiro; Itatsuda, Yoshiharu; Endoh, Takeyuki; Yabuuchi, Shigeru; and Yokozawa, Norio, 4,106,100, Cl. 364-702.000.
Takahashi, Tadashi; Morinaga, Shigeki; and Kubokura, Kuniaki, 4,104,978, Cl. 112-277.000.
Tsukushi, Masanori; Kashimura, Katsuichi; Hirasawa, Kunio; and Yoshioka, Yoshio, 4,105,879, Cl. 200-148.00A.
Yamazaki, Takeo; Wakui, Yoko; and Kosugi, Tetuo, 4,105,810, Cl. 427-248.00C.

Hobart Corporation: *See*—
Hoover, Richard D., 4,106,118, Cl. 366-185.000.

Hodge, Joel W. Mounting bracket for a newspaper delivery box. 4,105,180, Cl. 248-300.000.

Hodge, Jonathan Martin, to Momovis B.V. Sealing arrangement. 4,105,378, Cl. 418-195.000.

Hoechst Aktiengesellschaft: *See*—
Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 4,105,775, Cl. 424-273.00R.
Auer, Eberhard; Ohorodnik, Alexander; and Stutzke, Paul, 4,105,689, Cl. 260-502.500.
Dany, Franz-Josef; Maier, Karl; Riedel, Tomas; and Wortmann, Joachim, 4,105,735, Cl. 264-143.000.
Fischer, Hannes; and Werner, Gerhard, 4,105,607, Cl. 260-22.0CB.
Jung, Albert; Hultzsch, Kurt; Zimmermann, Rolf; and Reese, Johannes, 4,105,610, Cl. 260-27.0BB.
Moraw, Roland; and Schadlich, Gunther, 4,105,323, Cl. 355-9.000.
Schulz, Lothar; and Arpe, Hans-Jurgen, 4,105,753, Cl. 423-502.000.
Winkelmann, Erhardt; and Raether, Wolfgang, 4,105,763, Cl. 424-246.000.

Hoehn, Rudolph H., to Slater Electric Inc. Outlet box having screw mounting means. 4,105,862, Cl. 174-53.000.

Hoenisch, Walter Harold, to King-Seeley Thermos Co. Ice transport and dispensing system. 4,104,889, Cl. 62-137.000.

Hoeppel, Raymond W. Direction finding device and guidance system. 4,104,803, Cl. 33-352.000.

Hofer, Heinz P. Apparatus for temperature measurement. 4,104,916, Cl. 73-343.00B.

Hoff, Glen R.; Fotis, Peter, Jr.; and Boone, David E., to Standard Oil Company (Indiana). Increasing the particle size of as formed polyethylene or ethylene copolymer. 4,105,846, Cl. 526-124.000.

Hoffman, James T.: *See*—
Jones, John H.; and Hoffman, James T., 4,105,116, Cl. 206-484.000.

Hoffmann, Egon: *See*—
Heinrich, Hans J.; Koslowsky, Bernd; and Hoffmann, Egon, 4,105,558, Cl. 210-199.000.
Hoffmann, Helmut: *See*—
Baumann, Georg; and Hoffmann, Helmut, 4,106,075, Cl. 361-320.000.
Hoffmann, Klaus; Meyer, Rudolf; and Ohlschlager, Hans, to AGFA-Gevaert AG. Ink for the ink jet process. 4,106,027, Cl. 346-1.000.
Hoffmann-La Roche Inc.: *See*—
Bernet, Rudolf; Koller, Hans; and Wachberger, Eugen, 4,105,137, Cl. 222-1.000.
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,105,681, Cl. 260-404.000.
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 4,105,676, Cl. 260-345.90S.
Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, 4,105,664, Cl. 544-378.000.
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,105,852, Cl. 548-342.000.
Meienhofer, Johannes Arnold; and Wang, Su-Sun, 4,105,652, Cl. 260-112.50R.
Parrish, David Richard; and Hajos, Zoltan George, 4,105,696, Cl. 260-586.00F.
Hoffmann, Wolfgang, to B & H Manufacturing Company, Inc. Method and apparatus for applying sleeves to necks of bottles and other containers. 4,104,845, Cl. 53-14.000.
Hogue, Robert J., Jr. Tourniquet pressure monitor. 4,106,002, Cl. 340-626.000.
Hohenstein, Robert Mark: *See*—
Albert, William Charles; and Hohenstein, Robert Mark, 4,104,920, Cl. 73-517.0AV.
Hohne, Walter; and Hines, Robin H., to Precision International, Inc. Apparatus for producing a light beam having a uniform phase front and distance measuring apparatus. 4,105,332, Cl. 356-5.000.
Hohsho, Yukio; Karino, Kimiji; Momono, Masakichi; Oyama, Yoshishige; Yamauchi, Teruo; and Teranishi, Takao, to Hitachi, Ltd. Variable stage type carburetor. 4,105,720, Cl. 261-34.00A.
Holbrook, Mark Denton; and Fillmore, Richard Plumb, to RCA Corporation. Voltage multiplier circuit. 4,106,086, Cl. 363-60.000.
Holdiman, Joe W., to Scovill Manufacturing Company. Corner clip for a windowprodUct. 4,105,352, Cl. 403-402.000.
Holl, Friedrich, to C. Hohage & Cie. KG. Holder bar for sheet-like articles. 4,105,127, Cl. 211-124.000.
Holland, Steven W.: *See*—
Rossol, Lothar; Olsztyn, Joseph T.; Dewar, Robert; and Holland, Steven W., 4,105,925, Cl. 250-561.000.
Holmes, William A.; and Scholz, Donald T., to Polaroid Corporation. Programmable viewing system for processing and viewing cassette contained photographic film strips. 4,105,307, Cl. 352-72.000.
Holovacky, Julius: *See*—
Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, 4,105,744, Cl. 423-239.000.
Holub, Fred Frank: *See*—
Heath, Darrell Richard; Holub, Fred Frank; and Wilkus, Edward Vincent, 4,105,825, Cl. 428-379.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kogure, Hiroshi; and Shimada, Junichi, 4,104,881, Cl. 60-299.000.
Honeywell, Inc.: *See*—
Johnson, Eric S., 4,105,478, Cl. 148-188.000.
Johnson, Eric Shanks; and Schmit, Joseph Lawrence, 4,105,477, Cl. 148-187.000.
Johnson, Eric Shanks; and Schmit, Joseph Lawrence, 4,105,479, Cl. 148-189.000.
Lancaster, Robert A., 4,105,472, Cl. 148-1.500.
Robillard, Gene A., 4,104,789, Cl. 29-628.000.
Honeywell Information Systems Inc.: *See*—
Goss, Gary J.; and Joyce, Thomas F., 4,105,978, Cl. 328-58.000.
Honeywell Information Systems Italia: *See*—
Cislaghi, Ezio; Scotti, Alessandro; and Pederzini, Renzo, 4,106,108, Cl. 365-222.000.
Honjo, Satoru: *See*—
Miyatuka, Hajime; Saida, Takashi; and Honjo, Satoru, 4,105,448, Cl. 96-1.800.
Hoover, Richard D., to Hobart Corporation. Food processing apparatus. 4,106,118, Cl. 366-185.000.
Hori, Kiyoshi, to Nippon Paint Co., Ltd. Decorative relief finish process. 4,105,816, Cl. 428-159.000.
Horn, John H.; Morehead, William R.; Hurst, Ronald C.; Potter, Dennis J.; and Schaub, Clyde D., to Cabot Corporation. Production of carbon blacks. 4,105,750, Cl. 423-456.000.
Horne, John E.; Van Albert, Stephen A.; and Tousimis, A. J. Semi-automatic critical point drying apparatus. 4,104,808, Cl. 34-243.00R.
Horowitz, Carl; Dichter, Michael; and Mangaraj, Duryodhan, to Poly-Gulf Associates. Method of protectively coating metallic aluminum containing substrate. 4,105,811, Cl. 427-302.000.
Hort, Eugene Victor: *See*—
De Thomas, Waldo; and Hort, Eugene Victor, 4,105,674, Cl. 260-343.600.
Horvath, Ralph S.; and Chapel, Annette Moore. Suture and needle holder. 4,105,115, Cl. 206-370.000.
Hoshido, Mutsuo, to Sony Corporation. Cassette-type recording and/or reproducing apparatus with inadvertent erase preventing device. 4,106,064, Cl. 360-60.000.
Hosmer, Stephen L., to Young Windows Inc. Vent. 4,104,825, Cl. 49-324.000.
Hosoda, Haruji: *See*—
Hasebe, Shigeta, 4,105,528, Cl. 204-237.000.
Hosono, Akira; Isogai, Yoshihisa; Hasegawa, Hitoshi; and Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Gap self-compensating hydraulic rocker arm. 4,104,996, Cl. 123-90.430.
Hotta, Masahiro: *See*—
Tanei, Tadayoshi; Nakamura, Shigeki; and Hotta, Masahiro, 4,105,449, Cl. 96-1.800.
Houdaille Industries, Inc.: *See*—
Callahan, James J., 4,105,094, Cl. 184-7.00F.
House, Robert M.: *See*—
Latakas, Bernard; Copenhefer, John E.; and House, Robert M., 4,105,423, Cl. 55-501.000.
Howard, James S.: *See*—
Hendrickson, Donald W.; and Howard, James S., 4,105,050, Cl. 138-45.000.
Howard, John Arthur; Randall, Bryce Ernest; and Fleming-Brown, David Hugh, to Howard Machinery Limited. Hay baler. 4,104,853, Cl. 56-341.000.
Howard Machinery Limited: *See*—
Howard, John Arthur; Randall, Bryce Ernest; and Fleming-Brown, David Hugh, 4,104,853, Cl. 56-341.000.
Howell, Henry George: *See*—
Partyka, Richard Anthony; Standridge, Robert Ted; Howell, Henry George; and Shulgin, Alexander Theodore, 4,105,695, Cl. 260-570.80R.
Howlett, Donald L., to Texaco Inc. Logarithmic analog-to-digital converter. 4,106,010, Cl. 340-347.0AD.
Howmedica Inc.: *See*—
Graf, John W., 4,105,112, Cl. 206-1.500.
Howmet Turbine Components Corporation: *See*—
Veeck, Stewart J.; Freeman, William R.; and Dardi, Louis E., 4,104,782, Cl. 29-527.200.
Hoya Corporation: *See*—
Yamashita, Toshiharu, 4,105,577, Cl. 252-300.000.
Hoya Lens Corporation: *See*—
Ohno, Toshiaki; and Niizeki, Kiyoshi, 4,105,809, Cl. 427-164.000.
Hrabik, Heinrich, to Bonum-Werk Inh. Friedrich Hetzmannseder. Slide frame. 4,104,818, Cl. 40-152.000.
Huber, Richard, to Klinger AG. Sealing system for shutoff units. 4,105,187, Cl. 251-334.000.
Huffman, Stanley S., to Coors Container Company. Conveyor and feed control apparatus. 4,105,103, Cl. 193-32.000.
Huffman, William A.; and Brown, Harvey A., to Minnesota Mining and Manufacturing Company. Electro-optical devices containing methine arylidene dyes. 4,105,299, Cl. 350-349.000.
Hughes Aircraft Company: *See*—
Alexander, Thomas F.; and Griff, Gary J., 4,106,019, Cl. 343-9.000.
Hughes, Alexander W., Jr. Hand crank generator-powered rotary slide projector. 4,105,314, Cl. 353-85.000.
Hughes, Clifford Ronald; Jackson, Stephen John; Preston, John; and Walton, Peter Leslie, to Imperial Chemical Industries Limited. Alpha-amino ketone derivatives. 4,105,790, Cl. 424-309.000.
Hughes, John, to United States of America, Health, Education and Welfare. Purification of enkephalin, an endogenous composition in the human body and synthesis of same. 4,105,651, Cl. 260-112.50R.
Hultzsch, Kurt: *See*—
Jung, Albert; Hultzsch, Kurt; Zimmermann, Rolf; and Reese, Johannes, 4,105,610, Cl. 260-27.0BB.
Hung, Ling Kong: *See*—
Bloom, Allen; and Hung, Ling Kong, 4,105,654, Cl. 260-205.000.
Hunsucker, Jerry Hoyt; and Selleck, James R., Jr., to IMC Chemical Group, Inc. Method of controlling the growth of microorganisms. 4,105,552, Cl. 210-64.000.
Hunter, Byron Alexander; and Barrows, Franklin Herbert, to Uniroyal, Inc. 3,3'-Carbonylbis(carbazates) as blowing agents. 4,105,601, Cl. 521-95.000.
Hunts, Barney Dean: *See*—
Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,104,976, Cl. 112-121.110.
Hupfer, Leopold: *See*—
Himmele, Walter; Hupfer, Leopold; Toussaint, Herbert; and Paul, Gerhard, 4,105,669, Cl. 260-307.00F.
Hurst, Ronald C.: *See*—
Horn, John H.; Morehead, William R.; Hurst, Ronald C.; Potter, Dennis J.; and Schaub, Clyde D., 4,105,750, Cl. 423-456.000.
Husse, Massimo, to FIAT Societa per Azioni. Ultrasonic device for the determination of the rate of air flow in the inlet duct of an internal combustion engine. 4,104,915, Cl. 73-194.00A.
Hutton, Ronald E.; Oakes, Vincent; and Burley, Joseph, to Akzo N.V. Process for the preparation of organotin trihalides. 4,105,684, Cl. 260-429.700.
Huyck Corporation: *See*—
Pai, Karnire S., 4,105,495, Cl. 162-348.000.
Huyssen, Phillip H. Chain lock assembly. 4,105,231, Cl. 292-264.000.
Hyldon, Roy G.: *See*—
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,105,799, Cl. 426-44.000.
Hynes, John L., Jr., to Pfizer Inc. Patient handling system and apparatus for tomographic scanning. 4,105,923, Cl. 250-456.000.
Iacobucci, Guillermo A.; and Sweeny, James G., to Coca-Cola Company, The. Method for making 3-deoxyanthocyanidins. 4,105,675, Cl. 260-345.200.

Ichijima, Seiji: *See*—
Nakamura, Kotaro; Ichijima, Seiji; Furutachi, Nobuo; and Kosuge, Yosio, 4,105,656, Cl. 260-239.900.
ICI Australia Limited: *See*—
Knox, Donald Edward; Fakira, Suleiman Mohammed; and Mitchell, Kenneth Andrew William, 4,105,114, Cl. 206-219.000.
Ideal Toy Corporation: *See*—
Cooper, Julius; Carella, Vincent; Nielsen, Edwin; and Nemeth, Henry, 4,105,207, Cl. 273-89.000.
Idemitsu Kosan Company, Ltd.: *See*—
Kobayashi, Yasushi; Iwata, Minoru; Yoshida, Sadao; and Akatuka, Hisashi, 4,105,546, Cl. 210-11.000.
Iemura, Toshio: *See*—
Yamano, Masaru; and Iemura, Toshio, 4,105,913, Cl. 315-39.710.
Igarashi, Yoshiaki: *See*—
Arai, Kazuo; Igarashi, Yoshiaki; Suzuki, Masaki; Sano, Nobuya; and Yosumi, Toshikazu, 4,105,935, Cl. 318-314.000.
Ignasiak, Stanley F., to Sperry Rand Corporation. Penetration phosphors for display devices. 4,105,909, Cl. 313-473.000.
Iguchi, Masakazu: *See*—
Ishii, Takemochi; Iguchi, Masakazu; and Koshi, Masaki, 4,105,086, Cl. 180-79.000.
Ihara Chemical Industry Co. Ltd.: *See*—
Takahashi, Akio; and Saito, Hirokichi, 4,106,115, Cl. 366-138.000.
Iihashi, Mototaka: *See*—
Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; Umemoto, Sueo; and Suzuki, Kisaku, 4,105,511, Cl. 204-38.00A.
Iijima, Katsuhiko; and Jomen, Katsumasa, to Mitsubishi Jukogyo Kabushiki Kaisha. Hydraulic control system. 4,104,954, Cl. 91-45.000.
Iijima, Tetsuya, to Nissan Motor Company, Ltd. Hydraulic control system for a power transmission. 4,105,100, Cl. 192-.034.
Ikeda, Tomoaki: *See*—
Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,105,450, Cl. 96-33.000.
Ikeda, Yuji, to Sansui Electric Co., Ltd. Frequency synthesizer with phase locked loop and counter. 4,105,946, Cl. 331-1.00A.
Ilel, Elieser Persiado: *See*—
Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.
Iler, Ralph Kingsley; and Kirkland, Joseph Jack, to Du Pont de Nemours, E. I., and Company. Process for manufacture of macroporous microspheroids. 4,105,426, Cl. 65-18.000.
IMC Chemical Group, Inc.: *See*—
Eckler, Paul Eugene, 4,105,575, Cl. 252-182.000.
Hunsucker, Jerry Hoyt; and Selleck, James R., Jr., 4,105,552, Cl. 210-64.000.
Imperial Chemical Industries Limited: *See*—
Chase, Michael John, 4,104,878, Cl. 60-245.000.
Collins, David John; Kay, Ian Trevor; and Slater, John Walter, 4,105,433, Cl. 71-93.000.
Freeman, John Leslie, 4,105,635, Cl. 528-126.000.
Gibson, Keith Hopkinson, 4,105,854, Cl. 560-55.000.
Hughes, Clifford Ronald; Jackson, Stephen John; Preston, John; and Walton, Peter Leslie, 4,105,790, Cl. 424-309.000.
Knight, Harry Wilson, 4,106,012, Cl. 340-523.000.
Maslen, John; and Taylor, William Hunter, 4,105,621, Cl. 260-37.00N.
Taylor, Ian Charles, 4,105,636, Cl. 528-126.000.
Imperial Industries, Inc.: *See*—
Lewellen, Wendell G., Jr.; and Lankford, Loran A., 4,105,526, Cl. 204-213.000.
Imperial Oil Limited: *See*—
McQuitty, Stanley, 4,105,537, Cl. 208-11.0LE.
Industrie Pirelli Societa per Azioni: *See*—
Portinari, Antonio; and Lavezzari, Piero, 4,105,485, Cl. 156-382.000.
Infante, Javier D.: *See*—
Ingram, Lawrence L.; and Infante, Javier D., 4,104,975, Cl. 111-3.000.
Ingersoll-Rand Company: *See*—
Vliet, Walter Carl, 4,104,778, Cl. 29-407.000.
Ingram, Lawrence L.; and Infante, Javier D., to Bud Antle, Inc. Transplanting apparatus. 4,104,975, Cl. 111-3.000.
Inoue, Fumio, to Hitachi, Ltd. Vertical deflection circuit. 4,105,933, Cl. 315-387.000.
Inoue, Motoichiro; Shiga, Tsuyoshi; and Kasahara, Nobuo, to Ricoh Company, Ltd. Electrophotographic color process. 4,105,322, Cl. 355-4.000.
Inoue, Yasuo, to Olympus Optical Company Limited. Light source system. 4,106,078, Cl. 362-32.000.
INRYCO, Inc.: *See*—
Heintz, Dennis Ronald; and Thelen, Arthur Bertram, 4,104,840, Cl. 52-309.900.
Insolio, Thomas A., to Fletcher-Terry Company, The. Glass tube cutting machine. 4,105,150, Cl. 225-96.500.
Institut Francais du Petrole: *See*—
Delignieres, Robert, 4,105,991, Cl. 340-3.00D.
Institutul de Cercetari Stiintifice Pentru Protectia Muncii: *See*—
Macoveanu, Aurelian Liviu Alexandru; and Grecu, Nicolae, 4,104,918, Cl. 73-379.000.
International Business Machines Corporation: *See*—
Cowardin, Robert Lewis; and Laurer, George Joseph, 4,105,980, Cl. 328-165.000.
Desblache, Andre Eugene, 4,106,102, Cl. 364-724.000.
Gibson, David Kent; Miller, Myrl J.; and Snell, Spencer Allan, 4,105,327, Cl. 355-59.000.
Hinkel, Holger, 4,105,924, Cl. 250-492.00A.
Riseman, Jacob, 4,106,050, Cl. 357-49.000.
International Standard Electric Corporation: *See*—
Bedgood, Michael Albert; and Leach, John Stuart, 4,105,285, Cl. 350-96.210.
Beguin, Daniel E.; Bosc, Henri J.; and Colin, Jean-Marie H., 4,106,015, Cl. 343-5.00W.
International Tapetronics Corporation: *See*—
Jenkins, John P., 4,105,934, Cl. 318-7.000.
International Telephone and Telegraph Corporation: *See*—
Furda, Dymetro P., 4,106,077, Cl. 362-8.000.
Oeschger, Joseph E., 4,105,982, Cl. 335-151.000.
Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Borst, Hans; Evans, Reginald David Owen; and Rand, John Arthur, 4,105,539, Cl. 208-33.000.
Interox: *See*—
Brichard, Jean; Colery, Jean-Claude; and Meuret, Fernand, 4,105,827, Cl. 428-403.000.
Iowa State University Research Foundation, Inc.: *See*—
Larock, Richard Craig, 4,105,705, Cl. 260-668.00R.
Irick, Gether, Jr.: *See*—
Wang, Richard H. S.; and Irick, Gether, Jr., 4,105,631, Cl. 260-45.80A.
Irving, Donald W.; and Chamberlin, Donald W., to FMC Corporation. Fruit sorting circuitry. 4,105,123, Cl. 209-111.600.
Ishihara Sangyo Kaisha Ltd.: *See*—
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, 4,105,435, Cl. 71-94.000.
Ishii, Takemochi; Iguchi, Masakazu; and Koshi, Masaki. System for controlling vehicular four-wheel steering mechanisms. 4,105,086, Cl. 180-79.000.
Ishijima, Takashi: *See*—
Ishikawa, Takehiro; Yasuda, Kazumasa; Asano, Kazuhiro; and Ishijima, Takashi, 4,104,864, Cl. 58-39.500.
Ishikawa, Ryoichi: *See*—
Izutu, Hitoshi; and Ishikawa, Ryoichi, 4,105,622, Cl. 260-37.00N.
Ishikawa, Takehiro; Yasuda, Kazumasa; Asano, Kazuhiro; and Ishijima, Takashi, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,104,864, Cl. 58-39.500.
Ishimatsu, Kazuhiko; Nakahara, Takao; Murata, Akira; and Kuroki, Masami, to Nippon Mining Company. Process and apparatus for producing zirconium sponge. 4,105,192, Cl. 266-149.000.
Ishizuka, Masaaki: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,105,658, Cl. 260-239.30T.
Isogai, Yoshihisa: *See*—
Hoscno, Akira; Isogai, Yoshihisa; Hasegawa, Hitoshi; and Tanahashi, Toshio, 4,104,996, Cl. 123-90.430.
Isom, William C., to Isom, William C. Exhaust hood energy saving device. 4,105,015, Cl. 126-299.00D.
Itatsuda, Yoshiharu: *See*—
Okada, Kunihiro; Itatsuda, Yoshiharu; Endoh, Takeyuki; Yabuuchi, Shigeru; and Yokozawa, Norio, 4,106,100, Cl. 364-702.000.
Ito, Akira; and Iwata, Kenji, to Mitsui Toatsu Chemicals Inc. Method for polymerization of ethylene. 4,105,847, Cl. 526-125.000.
Ito, Fumio; Ito, Tadashi; Sunouchi, Akio; and Sorimachi, Kanehiro, to Canon Kabushiki Kaisha. Camera having improved mechanism for shutter actuation and film winding. 4,106,040, Cl. 354-205.000.
Ito, Fumio: *See*—
Nakamoto, Soichi; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,106,033, Cl. 354-23.00D.
Ito, Kunio: *See*—
Numata, Yasumasa; Ito, Kunio; Mori, Keiichi: and Ono, Yoshitami, 4,105,453, Cl. 96-114.500.
Ito, Michio: *See*—
Takahashi, Shigeo; and Ito, Michio, 4,104,798, Cl. 32-12.000.
Ito, Mikiji, to Nippondenso Co., Ltd. Exhaust gas purifying system having a diaphragm type control valve. 4,104,880, Cl. 60-290.000.
Ito, Tadashi: *See*—
Ito, Fumio; Ito, Tadashi; Sunouchi, Akio; and Sorimachi, Kanehiro, 4,106,040, Cl. 354-205.000.
Nakamoto, Soichi; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,106,033, Cl. 354-23.00D.
Itoh, Toshiyuki: *See*—
Hasebe, Nobutoshi; Itoh, Toshiyuki; and Hashimoto, Takashi, 4,105,158, Cl. 237-12.30C.
Itoi, Kazuo: *See*—
Fujita, Yoshiji; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,105,700, Cl. 568-875.000.
Itou, Kousuke: *See*—
Takeuchi, Junji; Itou, Shigeru; and Itou, Kousuke, 4,105,745, Cl. 423-239.000.
Itou, Shigeru: *See*—
Takeuchi, Junji; Itou, Shigeru; and Itou, Kousuke, 4,105,745, Cl. 423-239.000.
ITT Industries, Inc.: *See*—
Ade, Rolf; Schubert, Karl-Friedrich; and Staller, Manfred, 4,105,906, Cl. 310-87.000.
Ivy, Leon Harlan. Galvanometer mechanism mounted on printed circuit board having plug portion for insertion into control console receptacle. 4,105,969, Cl. 324-151.00R.
Iwai, Yuichiro; Shimoi, Akio; and Kawamura, Yoshikazu, to Kabushiki

Kaisha Suwa Seikosha. Touch sensitive input for electronic wristwatch and/or electronic calculator. 4,105,902, Cl. 307-308.000.
Iwaizumi, Takashi: *See—*
Kakumoto, Yoshiaki; Kanegawa, Mamoru; Iwaizumi, Takashi; and Matsumoto, Nobuo, 4,105,549, Cl. 210-33.000.
Iwami, Isamu; Kawasaki, Hironobu; and Kodama, Atsuro, to Asahi-Dow Limited. Polyamide compositions. 4,105,709, Cl. 260-857.00L.
Iwasaki, Ryohei, to Matsushita Seiko Co., Ltd. Air conditioning apparatus. 4,104,890, Cl. 62-324.000.
Iwasaki, Tetsuji: *See—*
Takeno, Tsuneyuki; Iwasaki, Tetsuji; Miyamoto, Norioki; Tachibana, Kyozaburo; and Matsukane, Masamoto, 4,105,436, Cl. 71-103.000.
Iwase, Yoshiyuki; Katayama, Shigeru; and Nakano, Takayuki, to Mitsui Petrochemical Industries Ltd. Process for producing hydrocarbon resins having improved color and thermal stability by heat treatment with an α,βunsaturated anhydride. 4,105,843, Cl. 526-77.000.
Iwata, Kenji: *See—*
Ito, Akira; and Iwata, Kenji, 4,105,847, Cl. 526-125.000.
Iwata, Kiyoshi: *See—*
Yoshida, Masumi; Iwata, Kiyoshi; Yamamoto, Eiichiro; Masui, Takeshi; and Kabuyama, Yukikazu, 4,105,998, Cl. 340-146.3AC.
Iwata, Minoru: *See—*
Kobayashi, Yasushi; Iwata, Minoru; Yoshida, Sadao; and Akatuka, Hisashi, 4,105,546, Cl. 210-11.000.
Izawa, Minoru: *See—*
Yamazaki, Hiroshi; and Izawa, Minoru, 4,104,862, Cl. 58-38.00R.
Izon Corporation: *See—*
Yevick, George J., 4,105,318, Cl. 353-120.000.
Izutu, Hitoshi; and Ishikawa, Ryoichi, to Dainippon Inc. & Chemicals Inc. Process for the preparation of flame retardant thermoplastic resin compositions. 4,105,622, Cl. 260-37.00N.
J. Aichelin KG: *See—*
Disch, Gunther; and Noormets, Elmar, 4,105,398, Cl. 432-121.000.
J. M. Huber Corporation: *See—*
Kunkle, Albert C.; and Kollmar, Carl E., Jr., 4,105,466, Cl. 106-309.000.
Wason, Satish K., 4,105,757, Cl. 424-49.000.
J. Ray McDermott & Co., Inc.: *See—*
Breaux, Earl J., 4,104,937, Cl. 82-34.00R.
J. T. Baker Chemical Company: *See—*
Seidenberger, James W., 4,105,576, Cl. 252-190.000.
J. u. W. Muller, Maschinen-und Armaturenfabrik GmbH: *See—*
Dobranis, Aurel, 4,105,963, Cl. 322-48.000.
Jackson, Kenneth Roy, to Hankin-Baker Limited. Precast chimney system. 4,104,868, Cl. 52-743.000.
Jackson, Stephen John: *See—*
Hughes, Clifford Ronald; Jackson, Stephen John; Preston, John; and Walton, Peter Leslie, 4,105,790, Cl. 424-309.000.
Jackson, William Lewis: *See—*
Corner, Michael Raymond; and Jackson, William Lewis, 4,105,254, Cl. 301-63.0DS.
Jacobs, Leonard, to TRW Inc. Electrical connector. 4,105,277, Cl. 339-95.00R.
Jacobs, William: *See—*
Jones, Lawrence T.; and Jacobs, William, 4,105,210, Cl. 273-126.00R.
Jacobsen, Ronald Lowell, to Procter & Gamble Company, The. Dishwasher detergent composition. 4,105,573, Cl. 252-99.000.
Jacobson, Samuel O. Multiple use study device. 4,105,182, Cl. 248-459.000.
Jagenberg-Werke Aktiengesellschaft: *See—*
Schonmeier, Herbert, 4,105,170, Cl. 242-65.000.
Jahns, Frederick D.; and Rand, Arthur G., Jr., to State of Rhode Island, Board of Regents for Education of the. Immobilized enzyme method to assess fish quality. 4,105,800, Cl. 426-61.000.
Jakl, Vladimir; Cink, Josef; and Bacovsky, Filip, to Vyzkumny ustav lykovych vlaken Superk; and Strojni a traktorova stanice v Zatci, narodni podnik Zatec. Arrangement for fixing hop guiding ropes in the soil. 4,104,823, Cl. 47-1.00R.
Jakob, Juergen: *See—*
Pennewiss, Horst; Plainer, Hermann; Quis, Peter; Trabitzsch, Hans; Masanek, Juergen; and Jakob, Juergen, 4,105,519, Cl. 204-159.230.
James Mackie & Sons Limited: *See—*
Mackie, Gordon, 4,105,166, Cl. 242-45.000.
James Morton Limited: *See—*
Rousom, Harold G., 4,105,344, Cl. 403-24.000.
Jamiolkowski, Dennis D.: *See—*
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,105,034, Cl. 128-335.500.
Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., to General Motors Corporation. Forming curved wafer thin magnets from rare earth-cobalt alloy powders. 4,104,787, Cl. 29-596.000.
Janousek, Jan: *See—*
Mikulecky, Karel; Tyl, Miloslav; Janousek, Jan; Burysek, Frantisek; Skoda, Stanislav; and Esner, Stanislav, 4,104,854, Cl. 57-34.00R.
Janson, John J. Oil spill retrieval system. 4,105,554, Cl. 210-96.00R.
Janssen, Raoul M. Wood sawing machine. 4,104,944, Cl. 83-471.200.
Japan Steel Works, Ltd., The: *See—*
Yaguchi, Hiroyasu; and Ono, Eishiro, 4,104,904, Cl. 72-445.000.
Jasper, Martin T.; and Koch, Peter, to United States of America, Agriculture. Bark burning system. 4,105,397, Cl. 432-90.000.
Jeffers, Frederick John; McClure, Richard John; and Lemke, James Underwood, to Eastman Technology, Inc. Method and apparatus for forming magnetic images by piezoelectric coupling between an optical image and a magnetostrictive imaging component. 4,106,028, Cl. 346-74.100.
Jeffreys, Dennis C.: *See—*
Johnston, Reed H.; Jeffreys, Dennis C.; and Stratton, Lawrence J., 4,106,007, Cl. 340-310.00A.
Stratton, Lawrence J.; Jeffreys, Dennis C.; Welz, Albert W., Jr.; and Johnston, Reed H., 4,105,897, Cl. 307-3.000.
Jenkins, John P., to International Tapetronics Corporation. Magnetic tape reproducer with series interconnected torque motors in play mode. 4,105,934, Cl. 318-7.000.
Jenne, Fredrick Benjamin, to American Microsystems, Inc. Epitaxial method of fabricating single igfet memory cell with buried storage element. 4,105,475, Cl. 148-175.000.
Jensen, Jens Herman: *See—*
Jensen, Jorn Benned; and Jensen, Jens Herman, 4,104,927, Cl. 123-179.00S.
Jensen, Jorn Benned; and Jensen, Jens Herman. Engine starter. 4,104,927, Cl. 123-179.00S.
Jernigan, James L., to United States of America, Navy. Chirped acousto-optic Q switch. 4,105,953, Cl. 331-94.50Q.
Jirkovsky, Ivo L.: *See—*
Philipp, Adolph H.; and Jirkovsky, Ivo L., 4,105,778, Cl. 424-275.000.
Johansson, Anders Erik Bertil: *See—*
Gillbrand, Per Sune; and Johansson, Anders Erik Bertil, 4,104,882, Cl. 60-600.000.
John Wyeth & Brother Limited: *See—*
Archibald, John Leheup; and Ward, Terence James, 4,105,771, Cl. 424-267.000.
Crossley, Roger; and Hill, David George, 4,105,773, Cl. 424-270.000.
Ward, Terence James, 4,105,666, Cl. 260-293.770.
John Zink Company: *See—*
Goodnight, Hershel E.; Reed, Robert D.; and Witwer, Alan D., 4,105,395, Cl. 431-351.000.
Reed, Robert D.; Zink, John S.; and Schwartz, Robert E., 4,105,394, Cl. 431-202.000.
Johnson, Alan Stanley William; and Tseung, Alfred Chan Chung, to National Research Development Corporation. Corrosion resistant electrodes for electrochemical use. 4,105,530, Cl. 204-290.00R.
Johnson, Eric S., to Honeywell, Inc. Doping HgCdTe with Li. 4,105,478, Cl. 148-188.000.
Johnson, Eric Shanks; and Schmit, Joseph Lawrence, to Honeywell, Inc. Doping of (Hg,Cd)Te with a Group VA element. 4,105,477, Cl. 148-187.000.
Johnson, Eric Shanks; and Schmit, Joseph Lawrence, to Honeywell, Inc. Preparation of halogen doped mercury cadmium telluride. 4,105,479, Cl. 148-189.000.
Johnson, Harlan B.: *See—*
Martinsons, Aleksandrs; and Johnson, Harlan B., 4,105,516, Cl. 204-98.000.
Johnson, Henry Charles, to RCA Corporation. FM-CW Radar ranging system. 4,106,020, Cl. 343-14.000.
Johnson, Lloyd H.: *See—*
Timo, Dominic P.; Placek, Ronald J.; Gonyea, David C.; Johnson, Lloyd H.; and Kure-Jensen, Jens, 4,104,908, Cl. 73-117.300.
Johnson, Morris Burton; and Richardson, Charles Raymond William, to Marconi Company Limited, The. Scanning minor stabilizer. 4,105,281, Cl. 350-6.500.
Johnson, Steven A.: *See—*
Greenleaf, James F.; and Johnson, Steven A., 4,105,018, Cl. 128-2.00V.
Johnson, William Henry: *See—*
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,105,852, Cl. 548-342.000.
Johnston, Clyde H. Apparatus for use in manufacturing and selecting golf clubs. 4,104,802, Cl. 33-174.00F.
Johnston, Franklin K., Jr. Solar heating method and apparatus. 4,105,042, Cl. 137-245.000.
Johnston, Reed H.; Jeffreys, Dennis C.; and Stratton, Lawrence J., to New England Power Service Company. Method and apparatus for transmitting intelligence over a carrier wave. 4,106,007, Cl. 340-310.00A.
Johnston, Reed H.: *See—*
Stratton, Lawrence J.; Jeffreys, Dennis C.; Welz, Albert W., Jr.; and Johnston, Reed H., 4,105,897, Cl. 307-3.000.
Jomen, Katsumasa: *See—*
Iijima, Katsuhiko; and Jomen, Katsumasa, 4,104,954, Cl. 91-45.000.
Jones, Howard, to Merck & Co., Inc. Preparation of 3β-hydroxy-27-norcholest-5,7-dien-25-one. 4,105,660, Cl. 260-239.55C.
Jones, John H.; and Hoffman, James T., to Beatrice Foods Co. Sample-containing envelope assembly. 4,105,116, Cl. 206-484.000.
Jones, Lawrence T.; and Jacobs, William, to California R & D Center. Hockey game apparatus. 4,105,210, Cl. 273-126.00R.
Jones, Leonard Leslie, to Mechandex Engineering (Wolverhampton) Ltd. Handling and cooling foundry sand. 4,106,112, Cl. 366-4.000.
Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, to Abbott Laboratories. Diacylated derivatives of γ-glutamyl dopamine. 4,105,787, Cl. 424-309.000.
Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, to Abbott Laboratories. Diacylated derivatives of gamma-glutamyl dopamine. 4,105,788, Cl. 424-309.000.
Jones, Roderick Frank: *See—*
Plummer, Dexter Robert; and Jones, Roderick Frank, 4,105,961, Cl. 318-676.000.

Jones, Terence A.: *See*—
Conder, Terrence M.; and Jones, Terence A., 4,105,292, Cl. 350-211.000.
Jordan, John W.: *See*—
Finlayson, Claude Malcolm; and Jordan, John W., 4,105,578, Cl. 252-316.000.
Joyce, Thomas F.: *See*—
Goss, Gary J.; and Joyce, Thomas F., 4,105,978, Cl. 328-58.000.
Jozat, Walter, to Koh-I-Noor Rapidograph, Inc. Automatic drafting device. 4,106,031, Cl. 346-140.00R.
Judd, Frederick V. H. Flow distributor for gas turbine silencers. 4,105,089, Cl. 181-264.000.
Jundt, Werner; Werner, Peter; Bodig, Bernd; Sohner, Gerhard; and Roth, Helmut, to Robert Bosch GmbH. Ignition system for internal combustion engine. 4,105,006, Cl. 123-148.00E.
Jung, Albert; Hultzsch, Kurt; Zimmermann, Rolf; and Reese, Johannes, to Hoechst Aktiengesellschaft. Reaction products of polydiolefins, phenols and unsaturated carboxylic acids. 4,105,610, Cl. 260-27.0BB.
Jungck, Philip R., to Leeds & Northrup Company. Combination measuring and reference potential electrode and method of measuring pH in samples subject to large voltage gradients. 4,105,509, Cl. 204-1.00T.
Junger, Manfred: *See*—
Schwaab, Manfred; Puschnerat, Helmut; Kluzik, Fritz; Junger, Manfred; Wilding, Ernst; and Tittes, Hans, deceased, 4,104,968, Cl. 101-415.100.
Jura Elektroapparate-Fabriken L. Henzirohs A.G.: *See*—
Hammer, Urs; and Gisiger, Ernst, 4,104,815, Cl. 38-77.500.
Justice, David D.; Ahn, Byung K.; and Dotson, Ronald L., to Olin Corporation. Process for electrolysis in a membrane cell employing pressure actuated uniform spacing. 4,105,514, Cl. 204-98.000.
Kabel-und Metallwerke Gutehoffnungshuette AG: *See*—
Rowell, Douglas W.; and Rethmann, Werner, 4,104,903, Cl. 72-264.000.
Kabelschlepp Gesellschaft mit beschrankter Haftung: *See*—
Moritz, Werner, 4,104,871, Cl. 59-78.100.
Kabushiki Kaisha Art Coffee: *See*—
Cho, Kichinosuke; and Watanabe, Tsutomu, 4,105,802, Cl. 426-329.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Ishikawa, Takehiro; Yasuda, Kazumasa; Asano, Kazuhiro; and Ishijima, Takashi, 4,104,864, Cl. 58-39.500.
Kondo, Kenichi, 4,104,863, Cl. 58-38.00R.
Sasaki, Seikou, 4,104,865, Cl. 58-58.000.
Yoda, Kazuhiro; and Nakamura, Michiaki, 4,104,861, Cl. 58-38.00R.
Kabushiki Kaisha Izumiseiki Seisakusho: *See*—
Sunahara, Takatoshi, 4,104,791, Cl. 30-90.100.
Kabushiki Kaisha Pollution Preventing Research Laboratory: *See*—
Ando, Wataru; and Nakaoka, Ichiro, 4,105,520, Cl. 204-162.00R.
Kabushiki Kaisha Seikosha: *See*—
Yamazaki, Hiroshi; and Izawa, Minoru, 4,104,862, Cl. 58-38.00R.
Kabushiki Kaisha Shikishima Tipton: *See*—
Kobayashi, Hisamine, 4,104,831, Cl. 51-164.00A.
Kabushiki Kaisha Suwa Seikosha: *See*—
Iwai, Yuichiro; Shimoi, Akio; and Kawamura, Yoshikazu, 4,105,902, Cl. 307-308.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Miyazaki, Tsutomu; Yoshizawa, Toshio; Yoshida, Yoshiaki; Mitsuya, Kinpei; and Ogasawara, Takeshi, 4,105,165, Cl. 242-18.0PW.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Asai, Kiyokazu; and Takeuchi, Akihiro, 4,105,004, Cl. 123-141.000.
Kabuyama, Yukikazu: *See*—
Yoshida, Masumi; Iwata, Kiyoshi; Yamamoto, Eiichiro; Masui, Takeshi; and Kabuyama, Yukikazu, 4,105,998, Cl. 340-146.3AC.
Kaganowicz, Grzegorz: *See*—
Levine, Aaron William; Kaganowicz, Grzegorz; and Datta, Pabitra, 4,105,298, Cl. 350-340.000.
Kagaya, Yutaka, to Silver Seiko Ltd. Program reading apparatus. 4,105,157, Cl. 235-475.000.
Kage, Kouzou, to Nippon Electric Co., Ltd. Clock regenerator comprising a frequency divider controlled by an up-down counter. 4,105,979, Cl. 328-164.000.
Kakumoto, Yoshiaki; Kanegawa, Mamoru; Iwaizumi, Takashi; and Matsumoto, Nobuo, to Ebara Infilco Kabushiki Kaisha. Method and apparatus for purification of water. 4,105,549, Cl. 210-33.000.
Kaldenberg, Henry J., to Maytag Company, The. Latch mechanism for appliance. 4,105,229, Cl. 292-113.000.
Kalkoff, Heinz-Dieter: *See*—
Wapelhorst, Friedrich-Wilhelm; and Kalkoff, Heinz-Dieter, 4,105,482, Cl. 156-96.000.
Kamber, Peter Werner: *See*—
Larsen, Hals Norman; and Kamber, Peter Werner, 4,104,876, Cl. 60-226.00R.
Kameswaran, Venkatamaran: *See*—
Berkelhammer, Gerald; and Kameswaran, Venkatamaran, 4,105,780, Cl. 424-282.000.
Kaminow, Ivan Paul: *See*—
Gloge, Detlef Christoph; Kaminow, Ivan Paul; and Presby, Herman Melvin, 4,105,283, Cl. 350-96.310.
Kanegawa, Mamoru: *See*—
Kakumoto, Yoshiaki; Kanegawa, Mamoru; Iwaizumi, Takashi; and Matsumoto, Nobuo, 4,105,549, Cl. 210-33.000.
Kani, Kenji: *See*—
Shiba, Hiroshi; and Kani, Kenji, 4,104,785, Cl. 29-574.000.
Kaniecki, Thaddeus J.: *See*—
Culmone, Vincent; and Kaniecki, Thaddeus J., 4,105,574, Cl. 252-154.000.
Kansai Paint Company, Limited: *See*—
Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; Umemoto, Sueo; and Suzuki, Kisaku, 4,105,511, Cl. 204-38.00A.
Kao Soap Co., Ltd.: *See*—
Takeno, Tsuneyuki; Iwasaki, Tetsuji; Miyamoto, Norioki; Tachibana, Kyozaburo; and Matsukane, Masamoto, 4,105,436, Cl. 71-103.000.
Kaplan, Jean-Pierre: *See*—
Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, 4,105,664, Cl. 544-378.000.
Kaplan, Stephen J.; and Gaba, Rodolfo, to Textron Inc. Filtering apparatus with modular filter elements. 4,105,562, Cl. 210-232.000.
Karch, John A.: *See*—
Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,105,416, Cl. 44-1.00R.
Karey, Hans; Oberheim, Robert; and Heintke, Hans-Eberhard, to Braun Aktiengesellschaft. Photo flash device. 4,106,080, Cl. 362-18.000.
Karino, Kimiji: *See*—
Hohsho, Yukio; Karino, Kimiji; Momono, Masakichi; Oyama, Yoshishige; Yamauchi, Teruo; and Teranishi, Takao, 4,105,720, Cl. 261-34.00A.
Kasahara, Nobuo: *See*—
Inoue, Motoichiro; Shiga, Tsuyoshi; and Kasahara, Nobuo, 4,105,322, Cl. 355-4.000.
Kashimura, Katsuichi: *See*—
Tsukushi, Masanori; Kashimura, Katsuichi; Hirasawa, Kunio; and Yoshioka, Yoshio, 4,105,879, Cl. 200-148.00A.
Katagi, Kazuo, to RCA Corporation. Polar to rectangular coordinate converter. 4,106,021, Cl. 343-5.0SC.
Katayama, Shigeru: *See*—
Iwase, Yoshiyuki; Katayama, Shigeru; and Nakano, Takayuki, 4,105,843, Cl. 526-77.000.
Kato, Taketoshi: *See*—
Ono, Kozo; and Kato, Taketoshi, 4,104,956, Cl. 91-491.000.
Katz, Jonathon H., to Teradyne, Inc. Test pin. 4,105,970, Cl. 324-158.00P.
Katz, Sidney. Coupling converter for vehicle antennas. 4,106,025, Cl. 343-715.000.
Kauffman, Robert N.: *See*—
Smith, James D. B.; and Kauffman, Robert N., 4,105,984, Cl. 336-60.000.
Kaufman, John Joseph; and Luisi, Thomas Emil, to Witco Chemical Corporation. Cable filler. 4,105,619, Cl. 260-33.6PQ.
Kaule, Wittich; and Stenzel, Gerhard, to G.A.O. Gesellschaft fur Automation und Organisation mbH. Method of identifying fluorescent materials. 4,105,333, Cl. 356-85.000.
Kawada, Seigo: *See*—
Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, 4,105,693, Cl. 260-558.00P.
Kawakita, Yukimasa; and Okuno, Youichi, to Canon Kabushiki Kaisha. Indicator in a finder. 4,106,038, Cl. 354-155.000.
Kawamura, Yoshikazu: *See*—
Iwai, Yuichiro; Shimoi, Akio; and Kawamura, Yoshikazu, 4,105,902, Cl. 307-308.000.
Kawano, Yasuhiko: *See*—
Noguchi, Shunsaku; Takei, Saburo; and Kawano, Yasuhiko, 4,105,670, Cl. 260-326.11R.
Kawasaki, Hironobu: *See*—
Iwami, Isamu; Kawasaki, Hironobu; and Kodama, Atsuro, 4,105,709, Cl. 260-857.00L.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Tachibana, Histaro; Fujii, Hisashi; and Sezaki, Tamotsu, 4,105,090, Cl. 181-265.000.
Kawasaki, Masahiro; and Sawada, Yoshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photometric circuit. 4,106,035, Cl. 354-51.000.
Kawasaki Seitetsu K.K.: *See*—
Ohnishi, Masayuki; Ohmori, Hisashi; and Yamamoto, Yoshiji, 4,105,059, Cl. 164-4.000.
Kawasaki, Tomonori. Power-supply device for working machine such as a spark-erosion machine. 4,106,087, Cl. 363-70.000.
Kay, Ian Trevor: *See*—
Collins, David John; Kay, Ian Trevor; and Slater, John Walter, 4,105,433, Cl. 71-93.000.
Kearney, Robert L.: *See*—
Wells, Thomas R.; and Kearney, Robert L., 4,105,319, Cl. 353-120.000.
Keeler, Frederick D. Tamper-proof closure. 4,105,132, Cl. 215-216.000.
Kehl, John. Carbide insert cutting tool. 4,105,357, Cl. 407-41.000.
Keizer, Eugene Orville, to RCA Corporation. Method for forming keel-tipped stylus for video disc systems. 4,104,832, Cl. 51-281.00R.
Keller, Dale L., to R. H. Sheppard Co., Inc. Dual cut boring tool assembly. 4,105,360, Cl. 408-118.000.
Kellermann, Arnold LeRoy; McDonald, David Ian; and Grone, Robert Joseph, to Cincinnati Milacron Inc. Article handling and coating apparatus. 4,104,984, Cl. 118-2.000.
Kelly, John Robert: *See*—
Schwerzel, Robert E.; Klosterman, Nancy E.; Kelly, John Robert; and Hillenbrand, Louis J., 4,105,014, Cl. 126-270.000.
Kelm, Edward C.: *See*—
Chivens, Donald R.; and Kelm, Edward C., 4,105,341, Cl. 400-144.200.
Kelter, S. Louis; and Kelter, Viviane S. Inflatable infant crib and carrier. 4,104,750, Cl. 5-93.00R.

Kelter, Viviane S.: *See—*
Kelter, S. Louis; and Kelter, Viviane S., 4,104,750, Cl. 5-93.00R.
Kelyman, Jacqueline S.: *See—*
Swart, Daniel J.; and Kelyman, Jacqueline S., 4,105,633, Cl. 528-176.000.
KemaNobel AB: *See—*
Norback, Hakan Nils; and Asp, Benkt Goran Rurik, 4,105,584, Cl. 252-426.000.
Petersen, Jorgen, 4,105,596, Cl. 521-56.000.
Kemeny, George A.: *See—*
Cookson, Alan H.; Kemeny, George A.; and Bolin, Philip C., 4,105,859, Cl. 174-14.00R.
Kempf, Paul S. Optical comparator and inspection apparatus. 4,105,340, Cl. 356-168.000.
Kenan, John E.: *See—*
Bork, C. Gary; and Kenan, John E., 4,105,353, Cl. 404-2.000.
Kendall Company, The: *See—*
Libman, Gary; and Villari, Frank K., 4,105,500, Cl. 195-103.50M.
Kennedy, James E., to Electro-Therm, Inc. Electric water heater utilizing a heat pipe. 4,105,895, Cl. 219-326.000.
Kennedy, Richard W.: *See—*
Boah, John K.; and Kennedy, Richard W., 4,104,786, Cl. 29-583.000.
Kent Air Tool Company: *See—*
Gunning, Samuel D., 4,105,080, Cl. 173-66.000.
Kenward, Richard George: *See—*
Moody, Asa Carlyle, Jr.; Kenward, Richard George; and Shiver, James William, 4,106,098, Cl. 364-500.000.
Kercso, Josef E., to Syntex (U.S.A.) Inc. Implant apparatus. 4,105,030, Cl. 128-217.000.
Kerner, Karl: *See—*
Blaich, Bernhard; Zehender, Ernst; and Kerner, Karl, 4,105,821, Cl. 428-215.000.
Kerr, Ralph O., to Denka Chemical Corporation. Oxidation catalysts and process for preparing anhydride from alkanes. 4,105,586, Cl. 252-437.000.
Kesic, Branimir; and Pytlarz, Charles P., to Zenith Radio Corporation. UHF Substrate tuner potentiometer. 4,105,989, Cl. 338-180.000.
Keskuslaboratorio-Centrallaboratorium Ab: *See—*
Forss, Kaj G.; and Fuhrmann, Agneta G. M., 4,105,606, Cl. 260-17.500.
Kessmar, Leo R., to Dana Corporation. Shift mechanism. 4,104,929, Cl. 74-473.00R.
Khajezadeh, Heshmat, to RCA Corporation. Integrated circuit protection device comprising diode having large contact area in shunt with protected bipolar transistor. 4,106,048, Cl. 357-40.000.
Kiguchi, Terumasa, to Kikuchi Kogyo Kabushiki Kaisha. Filtration device. 4,105,422, Cl. 55-446.000.
Kikuchi Kogyo Kabushiki Kaisha: *See—*
Kiguchi, Terumasa, 4,105,422, Cl. 55-446.000.
Killerwatt Corp.: *See—*
Miller, Jack V., 4,105,276, Cl. 339-95.00D.
Kimball, Richard M.: *See—*
Roeder, Allan W.; and Kimball, Richard M., 4,106,017, Cl. 343-8.000.
Kindig, Alan L., to General Electric Company. Methods for positioning insulating members in magnetic core slots. 4,104,788, Cl. 29-596.000.
King, Junior Keith; and Warden, Lowell W. Device for tamping and leveling concrete and the like. 4,105,355, Cl. 404-114.000.
King, Robin Charles Moorhouse; and Esterson, Maurice, to English Electric Valve Company Limited. Travelling wave tubes. 4,105,911, Cl. 315-3.500.
King-Seeley Thermos Co.: *See—*
Hoenisch, Walter Harold, 4,104,889, Cl. 62-137.000.
Kinoshita, Tadayoshi: *See—*
Tashiro, Mitsuhiko; Takeno, Shouzou; Mihara, Kakuo; and Kinoshita, Tadayoshi, 4,105,892, Cl. 219-216.000.
Kircher, Everett F.; and Dilworth, James L., to Boyne Mountain Lodge, Inc. Method and machine for making artificial snow. 4,105,161, Cl. 239-2.00S.
Kirkland, Joseph Jack: *See—*
Iler, Ralph Kingsley; and Kirkland, Joseph Jack, 4,105,426, Cl. 65-18.000.
Kitamoto, Tatsuji: *See—*
Masuyama, Kenichi; Sugisaki, Tsutomu; Kitamoto, Tatsuji; and Yamada, Yasuyuki, 4,106,067, Cl. 360-137.000.
Kitamura, Hajime; and Shimizu, Toshihide, to Shin-Etsu Chemical Co., Ltd. Method for the polymerization of vinyl chloride. 4,105,838, Cl. 526-62.000.
Kitamura, Hajime: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; Shimizu, Toshihide; and Fushimi, Kenji, 4,105,839, Cl. 526-62.000.
Kiyasu, John Y. Heart attack screening method, apparatus and kit for same. 4,105,499, Cl. 195-103.50R.
Klauber, Gerald: *See—*
Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,104,771, Cl. 29-25.140.
Kleebaur, Karl: *See—*
Hagenlocher, Walter; Neumann, Karl-Heinz; Muller, Martin; Kleebaur, Karl; Sokol, Gunter; and Molt, Jurgen, 4,105,907, Cl. 310-232.000.
Klein, Gerhart P., to P. R. Mallory & Co. Inc. Apparatus for applying material to a substrate. 4,104,985, Cl. 118-211.000.
Klein, Thomas, to National Semiconductor Corporation. Manufacturing a low voltage n-channel MOSFET device. 4,104,784, Cl. 29-571.000.
Klesper, Hugo: *See—*
Busse, Oswald; and Klesper, Hugo, 4,105,559, Cl. 210-225.000.
Klimaitis, Martin K., to Pacific Scientific Company. Large locking snubber. 4,105,098, Cl. 188-1.00B.
Klinger AG: *See—*
Huber, Richard, 4,105,187, Cl. 251-334.000.
Kljuev, Konstantin Nikolaevich: *See—*
Movchan, Boris Alexeevich; Timashov, Viktor Alexandrovich; and Kljuev, Konstantin Nikolaevich, 4,105,890, Cl. 219-121.0EB.
Klopfer, Howard J.: *See—*
Campbell, John R.; and Klopfer, Howard J., 4,105,857, Cl. 568-726.000.
Klosterman, Nancy E.: *See—*
Schwerzel, Robert E.; Klosterman, Nancy E.; Kelly, John Robert; and Hillenbrand, Louis J., 4,105,014, Cl. 126-270.000.
Kluge, Fritz: *See—*
Auer, Peter; Kluge, Fritz; Lieske, Helmut; and Wutzler, Horst, 4,105,382, Cl. 425-88.000.
Kluzik, Fritz: *See—*
Schwaab, Manfred; Puschnerat, Helmut; Kluzik, Fritz; Junger, Manfred; Wilding, Ernst; and Tittes, Hans, deceased, 4,104,968, Cl. 101-415.100.
Knight, Harry Wilson, to Imperial Chemical Industries Limited. Monitoring identified electrical switch contacts. 4,106,012, Cl. 340-523.000.
Knox, Donald Edward; Fakira, Suleiman Mohammed; and Mitchell, Kenneth Andrew William, to ICI Australia Limited. Apparatus and processes. 4,105,114, Cl. 206-219.000.
Knox, Hugh Stewart Geddes, to Cleveland Bridge & Engineering Co., Ltd., The. Cable spinning. 4,105,167, Cl. 242-54.00R.
Kobayashi, Hidetoshi; and Araki, Kohei, to Kureha Kagaku Kogyo Kabushiki Kaisha. Anthelmintic process for domestic animals. 4,105,779, Cl. 424-78.000.
Kobayashi, Hisamine, to Kabushiki Kaisha Shikishima Tipton. Automatic centrifugal barrel finishing machine. 4,104,831, Cl. 51-164.00A.
Kobayashi, Yasushi; Iwata, Minoru; Yoshida, Sadao; and Akatuka, Hisashi, to Idemitsu Kosan Company, Ltd. Method of treating waste water with activated sludge. 4,105,546, Cl. 210-11.000.
Kobe Steel, Ltd.: *See—*
Tuda, Goro; Shimizu, Katsuhiko; Murakami, Tudoi; and Nasu, Syouzi, 4,105,937, Cl. 318-568.000.
Koberstein, Edgar; and Lakatos, Eduard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Catalysts and the process for their production. 4,105,590, Cl. 252-464.000.
Koch, Karlheinz; and Rupilius, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien; and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Fertilizer compositions carrying an aminoalkanol as anticake agent. 4,105,430, Cl. 71-59.000.
Koch, Peter: *See—*
Jasper, Martin T.; and Koch, Peter, 4,105,397, Cl. 432-90.000.
Koci, Zdenek; and Mollet, Hans, to Ciba-Geigy Corporation. Dye preparation soluble in cold water. 4,105,401, Cl. 8-79.000.
Kodama, Atsuro: *See—*
Iwami, Isamu; Kawasaki, Hironobu; and Kodama, Atsuro, 4,105,709, Cl. 260-857.00L.
Koehring Corporation: *See—*
Loveless, Houston Lee, 4,105,356, Cl. 404-117.000.
Koelker, Carl Wilhelm: *See—*
Monnier, Denys; and Bolle, Pierre, 4,105,409, Cl. 23-232.00R.
Koenig, Wilbur V. Tennis stroke practice device. 4,105,204, Cl. 273-29.00A.
Koerner, Gotz; and Patzke, Hans-Jurgen, to Th. Goldschmidt AG. Organosilicon compounds and textile fiber finishes containing them. 4,105,567, Cl. 252-8.600.
Koga, Kazunori; and Nagano, Saburo, to Kyoto Ceramic Kabushiki Kaisha. Method of producing dense sintered silicon carbide body from polycarbosilanes. 4,105,455, Cl. 106-44.000.
Kogure, Hiroshi; and Shimada, Junichi, to Honda Giken Kogyo Kabushiki Kaisha. Prevention of overheating of catalytic converter for engine exhaust gases. 4,104,881, Cl. 60-299.000.
Koh-I-Noor Rapidograph, Inc.: *See—*
Jozat, Walter, 4,106,031, Cl. 346-140.00R.
Kokuryo, Shiro: *See—*
Nakamura, Junichi; Konuma, Hiroshi; Kokuryo, Shiro; Ueshima, Takashi; and Tsuge, Chutatsu, 4,105,608, Cl. 260-23.00R.
Kolbe, Peter: *See—*
Trautner, Jurgen; and Kolbe, Peter, 4,106,069, Cl. 361-30.000.
Koller, Hans: *See—*
Bernet, Rudolf; Koller, Hans; and Wachberger, Eugen, 4,105,137, Cl. 222-1.000.
Kollmar, Carl E., Jr.: *See—*
Kunkle, Albert C.; and Kollmar, Carl E., Jr., 4,105,466, Cl. 106-309.000.
Kondo, Kenichi, to Kabushiki Kaisha Daini Seikosha, JPX. Electronic timepiece having an alarm device. 4,104,863, Cl. 58-38.00R.
Kondo, Shinichi: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,105,658, Cl. 260-239.30T.
Kondo, Takashi: *See—*
Hirata, Hiroshi; and Kondo, Takashi, 4,105,310, Cl. 352-171.000.
Konishiroku Photo Industry Co., Ltd.: *See—*
Numata, Yasumasa; Ito, Kunio; Mori, Keiichi; and Ono, Yoshitami, 4,105,453, Cl. 96-114.500.

Konle, Robert L.: *See—*
Pury, Thomas; Gray, Floyd L.; Sivertsen, Marvin L.; Konle, Robert L.; and Stehr, Richard E., 4,105,920, Cl. 250-402.000.

Konrad, Marcel Celestin: *See—*
Rapp, Gunter; and Konrad, Marcel Celestin, 4,105,880, Cl. 200-148.00A.

Konuma, Hiroshi: *See—*
Nakamura, Junichi; Konuma, Hiroshi; Kokuryo, Shiro; Ueshima, Takashi; and Tsuge, Chutatsu, 4,105,608, Cl. 260-23.00R.

Kopp, Hans, to Georg Fischer Aktiengesellschaft. Cast one-piece annular rim member for a vehicle wheel. 4,105,255, Cl. 301-97.000.

Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Reichl, Richard; and Giesemann, Rolf, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing racemic or optically active 1-(2,6-dimethyl-phenoxy)-2-methylamino-propane and method of use. 4,105,796, Cl. 424-330.000.

Koppe, Herbert: *See—*
Kummer, Werner; Stahle, Helmut; Koppe, Herbert; Haarmann, Walter; and Reichl, Richard, 4,105,765, Cl. 424-248.560.

Kordesch, Karl Victor, to Union Carbide Corporation. Air depolarized cell. 4,105,830, Cl. 429-27.000.

Korneev, Alexandr Nikolaevich: *See—*
Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.

Kortenbach & Rauh Kommanditgesellschaft: *See—*
Schultes, Tilmann; and Seidel, Joachim, 4,105,039, Cl. 135-25.00A.

Koshi, Masaki: *See—*
Ishii, Takemochi; Iguchi, Masakazu; and Koshi, Masaki, 4,105,086, Cl. 180-79.000.

Koslowsky, Bernd: *See—*
Heinrich, Hans J.; Koslowsky, Bernd; and Hoffmann, Egon, 4,105,558, Cl. 210-199.000.

Kosonen, Vaino J., to Dorr-Oliver Incorporated. Continuous drum filter with improved agitator structure. 4,105,563, Cl. 210-383.000.

Kosuge, Yosio: *See—*
Nakamura, Kotaro; Ichijima, Seiji; Furutachi, Nobuo; and Kosuge, Yosio, 4,105,656, Cl. 260-239.900.

Kosugi, Masao: *See—*
Yoshida, Takashi; Kosugi, Masao; and Matsuyama, Takeshi, 4,106,044, Cl. 357-22.000.

Kosugi, Tetuo: *See—*
Yamazaki, Takeo; Wakui, Yoko; and Kosugi, Tetuo, 4,105,810, Cl. 427-248.00C.

Kotcharian, Michel, to Technigaz. Laminated sheets particularly for cryogenic enclosures, pipes, and the like. 4,105,819, Cl. 428-213.000.

Koval, Edmund R.: *See—*
Ulbing, Otmar M.; and Koval, Edmund R., 4,105,882, Cl. 200-157.000.

Kowalik, Peter M.; and Milianowicz, Stanislaw A., to Westinghouse Electric Corp. Circuit breaker apparatus with static pressure lock. 4,105,881, Cl. 200-148.00B.

Koyanagi, Shunichi; Kitamura, Hajime; Shimizu, Toshihide; and Fushimi, Kenji, to Shin-Etsu Chemical Co., Ltd. Method for polymerizing ethylenically unsaturated monomers in order to eliminate polymer deposition. 4,105,839, Cl. 526-62.000.

Krandex Corp.: *See—*
Slingluff, Eugene L., 4,105,732, Cl. 264-104.000.

Krasnov, Alexandr Ivanovich: *See—*
Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.

Krause, Dieter: *See—*
Lehmann, Karl-Otto, deceased; and Krause, Dieter, 4,105,138, Cl. 222-14.000.

Krause, Gerhard, to Siemens Aktiengesellschaft. Integrated amplifier with negative feedback. 4,105,943, Cl. 330-290.000.

Kresge, Edward N.: *See—*
O'Farrell, Charles P.; and Kresge, Edward N., 4,105,647, Cl. 526-33.000.

Kriemler, Hans-Peter: *See—*
Gruber, Urs; Greber, Gerd; and Kriemler, Hans-Peter, 4,105,648, Cl. 526-204.000.

Krimm, Heinrich: *See—*
Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, 4,105,641, Cl. 526-712.000.

Krohn, Antonin: *See—*
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,105,852, Cl. 548-342.000.

Krueger, Clarence L., to S. B. Whistler & Sons, Inc. Assembly for enabling close tolerance punching with a reusable system. 4,104,941, Cl. 83-133.000.

Krueger, Hans: *See—*
Geffcken, Walter; Krueger, Hans; and Walter, Karl-Heinz, 4,105,288, Cl. 350-350.000.

Kubodera, Seiiti: *See—*
Shiba, Keisuke; Aono, Toshiaki; Kubodera, Seiiti; Hirose, Takeshi; Ohi, Reiichi; and Shishido, Tadao, 4,105,452, Cl. 96-74.000.

Kubokura, Kuniaki: *See—*
Takahashi, Tadashi; Morinaga, Shigeki; and Kubokura, Kuniaki, 4,104,978, Cl. 112-277.000.

Kubota, Junjiro: *See—*
Sato, Kazukiyo; Takahashi, Katuo; Kubota, Junjiro; and Tsuchiya, Keiji, 4,105,199, Cl. 271-122.000.

Kubota, Naohiro: *See—*
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,105,625, Cl. 260-45.80N.

Kudo, Ryosuke, to Fujitsu Limited. Magnetic disc cartridge. 4,106,066, Cl. 360-133.000.

Kudritzki, Felix: *See—*
Caspar, Heinz; Kudritzki, Felix; and Ziegler, Horst, 4,104,924, Cl. 73-716.000.
Caspar, Heinz; and Kudritzki, Felix, 4,104,925, Cl. 73-716.000.

Kuehl, Donald Roy: *See—*
Meyers, George Leroy; and Kuehl, Donald Roy, 4,105,154, Cl. 229-27.000.

Kuhnen, W. Scott. Recycle paper collection receptacle device. 4,104,960, Cl. 100-25.000.

Kuhnlein, Hans, to Siemens Aktiengesellschaft. Position control device. 4,105,940, Cl. 318-653.000.

Kumar, Surinder: *See—*
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,105,799, Cl. 426-44.000.

Kumiai Chemical Industry Co., Ltd.: *See—*
Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, 4,105,693, Cl. 260-558.00P.

Kummer, Werner; Stahle, Helmut; Koppe, Herbert; Haarmann, Walter; and Reichl, Richard, to Boehringer Ingelheim GmbH. 2-(N-(1,3-diamino-isopropyl)-amino)-4-phenyl-2-imidazolines and salts thereof. 4,105,765, Cl. 424-248.560.

Kummer, Werner: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Reichl, Richard; and Giesemann, Rolf, 4,105,796, Cl. 424-330.000.

Kunchev, Nikola Tzanov: *See—*
Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.

Kunishige, Hidenori: *See—*
Miyagawa, Katsuhiko; Kunishige, Hidenori; Otsuka, Hirotaka; and Nakao, Fusafumi, 4,105,918, Cl. 250-337.000.

Kunkle, Albert C.; and Kollmar, Carl E., Jr., to J. M. Huber Corporation. Method for reducing the viscosity and for refining kaolin clays. 4,105,466, Cl. 106-309.000.

Kuo, Han C.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., to Olin Corporation. Plated metallic cathode. 4,105,531, Cl. 204-290.00R.

Kupperman, Dennis I.: *See—*
Kupperman, Sam; and Kupperman, Dennis I., 4,105,349, Cl. 403-209.000.

Kupperman, Sam; and Kupperman, Dennis I., to R B Toy Development Co. Mechanism for forming a loop in a rope or the like. 4,105,349, Cl. 403-209.000.

Kupsky, George A., to Owens-Illinois, Inc. Laser method of introducing mercury to gas discharge display panels. 4,105,889, Cl. 219-121.0LM.

Kuraray Company, Ltd.: *See—*
Fujita, Yoshiji; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,105,700, Cl. 568-875.000.

Kurata, Hirotaka: *See—*
Takahashi, Susumu; and Kurata, Hirotaka, 4,105,868, Cl. 179-15.0BT.

Kure-Jensen, Jens: *See—*
Timo, Dominic P.; Placek, Ronald J.; Gonyea, David C.; Johnson, Lloyd H.; and Kure-Jensen, Jens, 4,104,908, Cl. 73-117.300.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Kobayashi, Hidetoshi; and Araki, Kohei, 4,105,779, Cl. 424-78.000.

Kuroda, Mitura. Twist detecting device. 4,106,004, Cl. 200-61.170.

Kuroha, Noboru, to Nippon Kogaku K.K. Reflection type ellipsometer for measuring thin film phase difference and thickness. 4,105,338, Cl. 356-118.000.

Kuroki, Masami: *See—*
Ishimatsu, Kazuhiko; Nakahara, Takao; Murata, Akira; and Kuroki, Masami, 4,105,192, Cl. 266-149.000.

Kurtz, Leonard D.; and Bidwell, Robert E., to Deknatel, Inc. Attachable expansion chamber for pleural drainage device. 4,105,031, Cl. 128-276.000.

Kurumada, Tomoyuki: *See—*
Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,105,626, Cl. 260-45.8NZ.

Kurzmann, Helfried: *See—*
Lackner, Robert; Melwisch, Harald; and Kurzmann, Helfried, 4,106,063, Cl. 360-38.000.

Kuse, Matsuo: *See—*
Murata, Tomoji; Shibazaki, Kenji; Nakamura, Yoshihiro; and Kuse, Matsuo, 4,105,914, Cl. 235-92.0SB.

Kusters, Eduard: *See—*
Ahrweiler, Karl-Heinz, 4,105,387, Cl. 425-335.000.

Kustka, George John, to Bell Telephone Laboratories, Incorporated.

Arrangement for combining data symbols in accordance with a predetermined weighting function. 4,105,863, Cl. 178-67.000.

Kvamsdal, Rolf, to Moss Rosenberg Verft A/S. Procedure for loading cooled, liquefied gases, and tank for storing and/or transportation of cooled, liquefied gases. 4,104,887, Cl. 62-45.000.

Kyburz, Emilio: *See—*
Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, 4,105,664, Cl. 544-378.000.

Kyncl, Jaroslav: *See—*
Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, 4,105,787, Cl. 424-309.000.
Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, 4,105,788, Cl. 424-309.000.

Kyoritsu Yuki Co., Ltd.: *See—*
Tago, Atsuo; Yamanaka, Ryoichi; and Matsumoto, Susumu, 4,105,510, Cl. 203-14.000.

Kyoto Ceramic Kabushiki Kaisha: *See—*
Koga, Kazunori; and Nagano, Saburo, 4,105,455, Cl. 106-44.000.

La Barge, Robert L.; and Clawson, Robert G., to Aluminum Company of America. Container wall with rupturable weakening line. 4,105,133, Cl. 220-266.000.

Labecki, Karl W., to Textron Inc. Fastening device. 4,104,768, Cl. 24-207.000.

LaBounty, Roy E. Wheel and tire cutter. 4,104,792, Cl. 30-134.000.

Lackner, Robert; Melwisch, Harald; and Kurzmann, Helfried, to U.S. Philips Corporation. Circuit arrangement for a dropout detector. 4,106,063, Cl. 360-38.000.

Laeng, Rudolf; Strausak, Benedikt A.; and Vavrina, Josef. Hoods for record players and other sound recording or reproducing apparatus. 4,106,082, Cl. 362-87.000.

Laganis, Deno; and Begley, Paul M., to Schenectady Chemicals, Inc. Water soluble polyester resin. 4,105,639, Cl. 528-177.000.

Laimer, Friedrich; and Roth, Bernhard, to Netstal-Maschinen AG. Feeding screw assembly of a molding machine for plasticizing masses, particularly, for plastics or rubber. 4,106,113, Cl. 366-79.000.

Laitram Corporation, The: *See—*
Lapeyre, James M., 4,105,111, Cl. 198-844.000.

Lakatos, Eduard: *See—*
Koberstein, Edgar; and Lakatos, Eduard, 4,105,590, Cl. 252-464.000.

Lake, Timothy R., to Raymond Lee Organization, Inc., The. Safety windshield. 4,105,248, Cl. 296-84.00H.

Lambert, Thomas W.; and Blake, James Edward, to General Electric Company. CT number identifier in a computed tomography system. 4,105,922, Cl. 250-495.00T.

Lamberts, Ervins H., to UOP Inc. Gas spring suspension system for a vehicle seat. 4,105,195, Cl. 267-131.000.

Lamy, Jacques Edouard: *See—*
Dumont, Michel Paul; and Lamy, Jacques Edouard, 4,104,886, Cl. 61-112.000.

Lancaster, Robert A., to Honeywell, Inc. Preparation of silicon doped mercury cadmium telluride. 4,105,472, Cl. 148-1.500.

Land, Robert Perry, to Turpin Systems Company. Strap-down attitude and heading reference system. 4,106,094, Cl. 364-453.000.

Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, to Singer Company, The. Programmable sewing machine. 4,104,976, Cl. 112-121.110.

Landaud, Andre: *See—*
Lavigne, Jean C.; Nicolas, Yves; and Landaud, Andre, 4,105,070, Cl. 166-250.000.
Nicolas, Yves; and Landaud, Andre, 4,105,071, Cl. 166-250.000.

Landis Tool Company: *See—*
Scott, Donald K., Jr.; and McIntosh, Michael D., 4,105,962, Cl. 320-32.000.

Lane, Charles Anthony; and Lucking, Anthony James, to Waddington & Duval (Holdings) Limited. Pouring device. 4,105,141, Cl. 222-143.000.

Lang, Roy: *See—*
Hayashi, Izuo; and Lang, Roy, 4,105,955, Cl. 331-94.50H.

Lange, Karl Heinz, to Balda-Werke Photographische Gerate Und Kunststoff GmbH & Co., KG. Film-transport and shutter-control system for cameras. 4,106,041, Cl. 354-206.000.

Lankford, Loran A.: *See—*
Lewellen, Wendell G., Jr.; and Lankford, Loran A., 4,105,526, Cl. 204-213.000.

Lapeyre, James M., to Laitram Corporation, The. Flat link conveyor. 4,105,111, Cl. 198-844.000.

Larkin, Donald R., to Celanese Corporation. Purification of materials containing carbonyl contaminants. 4,105,701, Cl. 260-650.00R.

Larkworthy, Peter J.; Rose, James A.; and Martin, Anthony J., to Boeing Company, The. Apparatus for packing aircraft escape devices. 4,104,964, Cl. 100-232.000.

Larock, Richard Craig, to Iowa State University Research Foundation, Inc. Symmetrical biaryl synthesis via rhodium catalyzed dimerization of aryl mercuric salts. 4,105,705, Cl. 260-668.00R.

Larsen, Hals Norman; and Kamber, Peter Werner, to Boeing Company, The. Fan R. P. M. control loop stabilization using high rotor speed. 4,104,876, Cl. 60-226.00R.

Lass, Harold M., to Corban Industries, Inc. Dry wall taping machine having an improved dry wall cement dispensing box. 4,105,490, Cl. 156-526.000.

Last, James David, to University College of North Wales. Radio position-determining system. 4,106,022, Cl. 343-105.00R.

Latakas, Bernard; Copenhefer, John E.; and House, Robert M., to United States Gypsum Company. Compact air filter with tubular frame. 4,105,423, Cl. 55-501.000.

Lau, George W.; and Bujnowski, Edward J., to Binks Manufacturing Company. Trigger lock mechanism for spray guns. 4,105,164, Cl. 239-526.000.

Lauer, George E. Apparatus for orienting halved fruit cut side up. 4,105,108, Cl. 198-402.000.

Laurer, George Joseph: *See—*
Cowardin, Robert Lewis; and Laurer, George Joseph, 4,105,980, Cl. 328-165.000.

Lavezzari, Piero: *See—*
Portinari, Antonio; and Lavezzari, Piero, 4,105,485, Cl. 156-382.000.

Lavigne, Jean C.; and Nicolas, Yves, to Schlumberger Technology Corporation. Methods and apparatus for determining the stuck point of a conduit in a borehole. 4,104,911, Cl. 73-151.000.

Lavigne, Jean C.; Nicolas, Yves; and Landaud, Andre, to Schlumberger Technology Corporation. Methods for determining the stuck point of a conduit in a borehole. 4,105,070, Cl. 166-250.000.

Law, Andrew B.: *See—*
Lewis, Sheldon N.; Miller, George A.; and Law, Andrew B., 4,105,431, Cl. 71-67.000.

Lawless, Earl E. Extraction tool. 4,104,775, Cl. 29-265.000.

Lazarus, Harry J. Spectacle frame with angularly adjustable temples and means for manufacturing and assembling same. 4,105,305, Cl. 351-111.000.

Leach, John Stuart: *See—*
Bedgood, Michael Albert; and Leach, John Stuart, 4,105,285, Cl. 350-96.210.

Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich. Voltage regulation and stabilization device. 4,105,964, Cl. 323-43.50S.

Lechevin, Rene; and Butin, Henri, to Thomson-CSF. Synchronous demodulation device. 4,105,981, Cl. 329-50.000.

Leconte, Gilles, to Regie Nationale des Usines Renault. Sequential control circuit capable of sequencing through a number of stable states in a predetermined order. 4,105,928, Cl. 315-82.000.

L'Ecuyer, Camille; and Poulin, Laurent. Gymnastic balance beam. 4,105,201, Cl. 272-111.000.

Ledford, Edward B., Jr.: *See—*
McIver, Robert T., Jr.; and Ledford, Edward B., Jr., 4,105,917, Cl. 250-291.000.

Lee, Wei-Kuo, to Celanese Corporation. Spinning method and apparatus. 4,105,728, Cl. 264-40.700.

Leeds & Northrup Company: *See—*
Jungck, Philip R., 4,105,509, Cl. 204-1.00T.

Lees, Geoffrey; Williams, Arthur Roger; and Bond, Robert, to Dunlop Limited. Road surfaces. 4,105,458, Cl. 106-97.000.

Leete, Bernard D.: *See—*
Demarest, Donald M.; and Leete, Bernard D., 4,106,085, Cl. 363-51.000.

Lehmann, Gertrude, heiress: *See—*
Lehmann, Karl-Otto, deceased; and Krause, Dieter, 4,105,138, Cl. 222-14.000.

Lehmann, Karl-Otto, deceased (by Lehmann, Gertrude, heiress); and Krause, Dieter, to Apparatebau Hundsbach Prof. Dr.-Ing. Habil., Dr. Phil. Nat. Karl-Otto Lehmann, Nachf., GmbH, Cie. Apparatus for presetting volumes of liquid. 4,105,138, Cl. 222-14.000.

Lehner, Peter, to Leigh Textile Company. Cutting hard fibrous material. 4,104,765, Cl. 19-0.600.

Leidich, Arthur John, to RCA Corporation. Monostable circuit. 4,105,901, Cl. 307-273.000.

Leigh Textile Company: *See—*
Lehner, Peter, 4,104,765, Cl. 19-0.600.

Leitner, Kajetan. Fixing stud for joining building or constructional elements. 4,104,951, Cl. 85-5.00R.

Leloux, Arnoldus Willem Jan, to Wavin B.V. Device for manufacturing perforated plastic pipes. 4,104,942, Cl. 83-327.000.

Lemke, James Underwood: *See—*
Jeffers, Frederick John; McClure, Richard John; and Lemke, James Underwood, 4,106,028, Cl. 346-74.100.

Lennon, Carl L.; and Britt, Thomas O., to United States of America, National Aeronautics and Space Administration. Remote lightning monitor system. 4,105,966, Cl. 324-113.000.

Leonard, Henri, to Micro-Mega S.A. Dental handpiece. 4,104,799, Cl. 32-26.000.

Leonhart, Franz Xaver. Coin release device for coin operated games. 4,105,104, Cl. 194-57.000.

Lermann, Peter: *See—*
Wick, Richard; Stemme, Otto; Lermann, Peter; and Schultheiss, Karl-Heinz, 4,106,036, Cl. 354-83.000.

Leroy, Jean-Marie Louis: *See—*
Brouard, Claude Marie Henri Emile; Dupont, Bernard; Leroy, Jean-Marie Louis; and Stiot, Jean-Pierre Henri, 4,105,653, Cl. 260-158.000.

Levasseur, Joseph L.; and Seiter, William A., to H. R. Electronics Company. Control circuit for pay telephones and the like. 4,105,867, Cl. 179-6.30R.

Levecque, Marcel; and Battigelli, Jean A., to Saint-Gobain Industries. Method and apparatus for suppression of pollution in mineral fiber manufacture. 4,105,424, Cl. 65-3.00C.

Leverenz, Klaus: *See—*
Gottschlich, Alois; and Leverenz, Klaus, 4,105,655, Cl. 260-207.100.

Levey, Virginius T., to Thompson, Ida M. Window and door lock. 4,105,233, Cl. 292-288.000.

Levijoki, Wayne A., to General Motors Corporation. Servomotor with position feedback. 4,105,088, Cl. 180-108.000.

Levine, Aaron William; Kaganowicz, Grzegorz; and Datta, Pabitra, to RCA Corporation. Electro-optic devices. 4,105,298, Cl. 350-340.000.

Levington, Henry John, to Clayton Dewandre Company Limited. Hydraulic cab tilting systems. 4,105,087, Cl. 180-89.150.

Levis, William W., Jr.: *See—*
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,105,597, Cl. 521-159.000.

Levresse, Bernard: *See—*
Machon, Jean-Pierre; Levresse, Bernard; and Gloriod, Pierre, 4,105,609, Cl. 260-23.00H.

Levy, Stanley Burton; and Garlington, William Drake, to Du Pont de Nemours, E. I., and Company. Apparatus for stretching film. 4,104,769, Cl. 26-92.000.

Lewellen, Wendell G., Jr.; and Lankford, Loran A., to Imperial Industries, Inc. Processing barrel with stationary U-shaped hanger arm and collar bearing assemblies. 4,105,526, Cl. 204-213.000.

Lewis, J. Claybrook: *See—*
Capra, Nicholas G., 4,105,145, Cl. 222-340.000.

Lewis, Peter Frederick: *See—*
Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, 4,105,951, Cl. 331-90.000.

Lewis, Sheldon N.; Miller, George A.; and Law, Andrew B., to Rohm and Haas Company. 3-Isothiazolones as biocides. 4,105,431, Cl. 71-67.000.

Lexitron Corporation: *See—*
Chivens, Donald R.; and Kelm, Edward C., 4,105,341, Cl. 400-144.200.

Leybold-Heraeus GmbH & Co. KG: *See—*
Henschke, Siegfried; and Lindberg, Albert, 4,105,273, Cl. 339-47.00R.

Liao, Paul Foo-Hung: *See—*
Bjorklund, Gary Carl; and Liao, Paul Foo-Hung, 4,105,337, Cl. 356-114.000.

Libandor Trading Corporation Inc.: *See—*
Braum, Ludwig, 4,105,105, Cl. 194-100.00A.

Libman, Gary; and Villari, Frank K., to Kendall Company, The. Diagnostic device for a liquid sample and method. 4,105,500, Cl. 195-103.50M.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Rapp, Gunter; and Konrad, Marcel Celestin, 4,105,880, Cl. 200-148.00A.

Liedtke, Larry L.: *See—*
Petersen, Gary L.; and Liedtke, Larry L., 4,104,970, Cl. 102-220.000.

Lieske, Helmut: *See—*
Auer, Peter; Kluge, Fritz; Lieske, Helmut; and Wutzler, Horst, 4,105,382, Cl. 425-88.000.

Lightning Fasteners Limited: *See—*
Warren, David, 4,104,767, Cl. 24-205.11R.

Likhyani, Kewal Krishan: *See—*
Baker, Richard Anson; Forsythe, George Daniel; Likhyani, Kewal Krishan; Roberts, Robert Earl; and Robertson, David Charles, 4,105,548, Cl. 210-23.00H.

Lin, Feng. Dispenser for insect or vermin poison. 4,105,144, Cl. 222-187.000.

Lin, Liang-Chuan, to Globe Industries Corporation. Printing ink transfer process. 4,105,483, Cl. 156-154.000.

Lindberg, Albert: *See—*
Henschke, Siegfried; and Lindberg, Albert, 4,105,273, Cl. 339-47.00R.

Lindberg, Allen W., to ACF Industries, Inc. Solenoid apparatus. 4,105,726, Cl. 261-121.00B.

Lindmayer, Joseph. Solar cell with discontinuous junction. 4,106,047, Cl. 357-30.000.

Lindsey, Duane A. Muck dredging machine. 4,104,813, Cl. 37-57.000.

Liquid Carbonic Canada Ltd.: *See—*
Ross, Edward Alan, 4,105,725, Cl. 261-122.000.

Liquid Packaging Holdings Limited: *See—*
Mosse, Richard Wolfgang Emil, 4,104,849, Cl. 53-379.000.

Listmann, Horst: *See—*
Birner, Winfried; Mueller, Hans; Listmann, Horst; and Bassner, Helmut, 4,104,875, Cl. 60-202.000.

Little, Donald M.; and Hann, Paul D., to Phillips Petroleum Company. Combination alkylation-reforming process. 4,105,707, Cl. 260-683.480.

Litton Systems, Inc.: *See—*
Baron, David Alan; and Hampton, James Ronald, 4,105,886, Cl. 219-10.55E.

Liu, Hsin. Method and apparatus for recovering metals. 4,105,437, Cl. 75-10.00R.

Locke, Frank W., to Champion International Corporation. Paperboard bulk bin. 4,105,153, Cl. 229-23.00R.

Lockheed Aircraft Corporation: *See—*
Cronin, Michael Joseph, 4,106,013, Cl. 340-27.00R.

Loctite (Ireland) Limited: *See—*
Gleave, Edward Roger, 4,105,715, Cl. 260-881.000.

Lofdahl, Clyde A., to Raychem Corporation. Encapsulation method for electrical elements. 4,105,481, Cl. 156-79.000.

Lofquist, Robert Alden; and Saunders, Peter Reginald, to Allied Chemical Corporation. Substituted thioureas to inhibit ozone fading of dyed polyamides. 4,105,404, Cl. 8-165.000.

Loge, Olaf: *See—*
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,105,792, Cl. 424-313.000.

Long, Paul J., Jr., to General Motors Corporation. Shock absorber and leveling unit with auxiliary damping device for vehicle suspensions. 4,105,193, Cl. 267-64.00R.

Long, Paul J., Jr.: *See—*
Graham, Donald E.; and Long, Paul J., Jr., 4,105,216, Cl. 280-6.00R.

Lonza, Ltd.: *See—*
Arni, Urs; Faucci, Adriano; and Stocker, August, 4,105,688, Cl. 260-465.80R.

Loomis International, Inc.: *See—*
Rathburn, Lloyd C., 4,105,215, Cl. 277-116.200.

Loos, Elsio J.: *See—*
Van Wagener, Raymond H.; Raasch, Ernest M.; and Loos, Elsio J., 4,105,196, Cl. 270-58.000.

Lopez, Eugene F.: *See—*
Glover, Leon C.; and Lopez, Eugene F., 4,105,583, Cl. 252-408.000.

Lopez, Tiburcio Coria; and Coria, Yolanda Teevin. Safety matchpacket cover to prevent children from using any match. 4,105,113, Cl. 206-100.000.

Lopic, Franc, to Gardena Kress & Kastner GmbH. Electrical cutting appliances. 4,104,795, Cl. 30-272.00A.

Lord Corporation: *See—*
Finney, Robert H., 4,105,266, Cl. 308-237.00R.

L'Oreal: *See—*
Sebag, Henri; and Vanlerberghe, Guy, 4,105,580, Cl. 252-351.000.

Lorenz, Kurt, to Carl Still, Firma. Apparatus for producing form coke. 4,105,504, Cl. 202-91.000.

Loth, John Lodewyk. Overspeed control arrangement for vertical axis wind turbines. 4,105,363, Cl. 416-41.000.

Lotto, Ronald L., to FMC Corporation. Apparatus for making bottom seal thermoplastic bags. 4,105,489, Cl. 156-510.000.

Loveless, Houston Lee, to Koehring Corporation. Vibratory roller. 4,105,356, Cl. 404-117.000.

Lovett, Wayne D. Multi-purpose test tube. 4,105,415, Cl. 23-292.000.

Low, William W.: *See—*
Swaine, James W., Jr.; Low, William W.; and Bean, Samuel L., 4,105,754, Cl. 423-514.000.

Loyda, Miloslav: *See—*
Bukac, Zbynek; Sebenda, Jan; and Loyda, Miloslav, 4,105,644, Cl. 528-314.000.

Lu, Chen-i: *See—*
Williams, Robert Franklin, Jr.; and Lu, Chen-i, 4,105,118, Cl. 206-524.200.

Lucas Industries Limited: *See—*
Cockshott, Charles Peter; and Moore, John Howard, 4,104,913, Cl. 73-194.00F.
Seilly, Alec Harry, 4,105,904, Cl. 310-27.000.

Luciano, David P. Animal attraction method and apparatus. 4,105,992, Cl. 340-15.000.

Lucking, Anthony James: *See—*
Lane, Charles Anthony; and Lucking, Anthony James, 4,105,141, Cl. 222-143.000.

Ludwig Heumann & Co. GmbH.: *See—*
Haake, Manfred; Pothmann, Reinhold; Ahrens, Kurt H.; and Fritschi, Edgar, 4,105,795, Cl. 424-320.000.

Luisi, Thomas Emil: *See—*
Kaufman, John Joseph; and Luisi, Thomas Emil, 4,105,619, Cl. 260-33.6PQ.

Lund, Albert H.: *See—*
Davis, Kenneth G.; Due, George B.; and Lund, Albert H., 4,105,614, Cl. 260-29.40R.

Lundberg, Robert D.; and Thame, Neville G., to Exxon Research & Engineering Co. Multiphase block and graft copolymers comprising a hydrophilic continuous phase and hydrophobic domains. 4,104,824, Cl. 47-58.000.

Lundeen, Allan J.: *See—*
Starks, Charles M.; and Lundeen, Allan J., 4,105,698, Cl. 568-744.000.

Lundquist, Ingemar H., to Syntex Puerto Rico, Inc. Inhalation device. 4,105,027, Cl. 128-206.000.

Luthi, Christian, to Ciba-Geigy Corporation. Optically brightening with a synergistic mixture. 4,105,399, Cl. 8-1.00W.

Lyons, Robert J. Mounting means for door-check for torsionally balanced hatchway door. 4,104,761, Cl. 16-84.000.

M&T Chemicals Inc.: *See—*
Balatan, Sergio E., 4,105,615, Cl. 260-29.60T.

MacDonald, Ian: *See—*
Naslund, Edwin N.; and MacDonald, Ian, 4,104,828, Cl. 49-399.000.

Macemon, James H., to Baxter Travenol Laboratories, Inc. Automatic range selection circuit. 4,105,967, Cl. 324-115.000.

Machon, Jean-Pierre; Levresse, Bernard; and Gloriod, Pierre, to Societe Chimique des Charbonnages. Deactivation of catalysts of the Ziegler type used for the preparation of polyethylene in high pressure, high temperature processes. 4,105,609, Cl. 260-23.00H.

Machon, Jean-Pierre: *See—*
Nicco, Adrien; and Machon, Jean-Pierre, 4,105,842, Cl. 526-65.000.

Mack, Joseph A.: *See—*
Anderson, Edwin V.; and Mack, Joseph A., 4,105,348, Cl. 403-172.000.

MacKay, Malcolm H. Dispersing apparatus. 4,106,116, Cl. 366-144.000.

Mackie, Gordon, to James Mackie & Sons Limited. Textile yarn or tape winding machines. 4,105,166, Cl. 242-45.000.

MacLean, Alexander, to Electro Switch Corp. Control switch relay and control circuit means. 4,106,072, Cl. 361-156.000.

Macoveanu, Aurelian Liviu Alexandru; and Grecu, Nicolae, to Institutul de Cercetari Stiintifice Pentru Protectia Muncii. Electrodynamograph. 4,104,918, Cl. 73-379.000.

MacPherson, John Hugh, agent: *See*—
Coon, Marvin D., deceased; and MacPherson, John Hugh, agent, 4,105,417, Cl. 44-63.000.

MacPherson, Roy Duncan: *See*—
Haines, Kendrick Peter; and MacPherson, Roy Duncan, 4,105,532, Cl. 204-301.000.

Maeno, Shizuo: *See*—
Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,105,781, Cl. 424-283.000.

Mages, Bernhard: *See*—
Rock, Erich; and Mages, Bernhard, 4,104,762, Cl. 16-129.000.

Magnatex Limited: *See*—
Tomlin, Robert Derrick, 4,105,296, Cl. 350-307.000.

Magness, Albert H. Z shelf bracket stocking and display device. 4,105,125, Cl. 211-13.000.

Magosch, Karl-Heinz: *See*—
Rueter, Joern; Burzin, Klaus; Magosch, Karl-Heinz; and Feinauer, Roland, 4,105,672, Cl. 260-340.200.

Mahan, Philip J. C. Sawhorse. 4,105,091, Cl. 182-181.000.

Mahoney, Kurt. Moisture detector. 4,106,001, Cl. 340-604.000.

Maier, Karl: *See*—
Dany, Franz-Josef; Maier, Karl; Riedel, Tomas; and Wortmann, Joachim, 4,105,735, Cl. 264-143.000.

Maillot, Jean, to Guterman, Paulette. Anti-theft device with disabling means. 4,106,000, Cl. 340-530.000.

Makarainen, Eino A.: *See*—
Bizzell, David; and Makarainen, Eino A., 4,105,209, Cl. 273-106.50R.

Mancini, Luciano: *See*—
Zanella, Giuseppe; and Mancini, Luciano, 4,105,727, Cl. 264-12.000.

Mangaraj, Duryodhan: *See*—
Horowitz, Carl; Dichter, Michael; and Mangaraj, Duryodhan, 4,105,811, Cl. 427-302.000.

Manser, Josef; and Egger, Friedrich, to Gebrueder Buehler AG. Method and apparatus for processing vegetable foodstuffs. 4,104,958, Cl. 99-355.000.

Manzoni, Pier Luigi: *See*—
Vargiu, Silvio; Manzoni, Pier Luigi; Bernasconi, Mario; and Parodi, Antonio, 4,105,604, Cl. 260-17.200.

Marchese, Thomas F.; and Argon, Rauf S., to American Optical Corporation. Pacemaker artifact suppression in coronary monitoring. 4,105,023, Cl. 128-2.06B.

Marchesini, Bruno; and Martini, Fernando. Apparatus for continuous dyeing of textiles. 4,104,893, Cl. 68-5.00E.

Marconi Company Limited, The: *See*—
Johnson, Morris Burton; and Richardson, Charles Raymond William, 4,105,281, Cl. 350-6.500.

Marecek, Josef: *See*—
Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, 4,105,744, Cl. 423-239.000.

Maremont Corporation: *See*—
Smeltzer, Paul; Sharma, Kris; Daneck, David A.; and McNally, Sellers B., 4,105,194, Cl. 267-64.00R.

Margen, Peter Heinrich Erwin: *See*—
Naslund, Rolf Paul; Ahrbom, Karl Bertil; and Margen, Peter Heinrich Erwin, 4,105,389, Cl. 425-392.000.

Margittai, Thomas, to Yuter, Seymour C., a part interest. Sequential drying system with isolated closed drying paths. 4,104,805, Cl. 34-5.000.

Margotte, Dieter; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Flame-resistant polycarbonate molding compositions. 4,105,712, Cl. 260-873.000.

Mark, Albert: *See*—
Glendinning, William Bernard; and Mark, Albert, 4,105,805, Cl. 427-38.000.

Markusch, Peter: *See*—
Dieterich, Dieter; and Markusch, Peter, 4,105,594, Cl. 521-100.000.

Marquez, Victor E.: *See*—
Driscoll, John S.; Marquez, Victor E.; and Peng, Geoffrey, 4,105,774, Cl. 424-273.00R.

Marshall, Denis John; and Mohin, Terry Martin, to BOC Limited. Welding apparatus and method. 4,105,887, Cl. 219-72.000.

Marshall, Duane: *See*—
Rines, Robert H.; and Marshall, Duane, 4,105,990, Cl. 340-3.00R.

Marshall, Robert Moore; and Darboufas, Kimon Constantine, to Allied Chemical Corporation. Finish for polyester filamentary yarns. 4,105,568, Cl. 252-8.600.

Martens, Gunter, legal heir: *See*—
Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.

Martens, Hannelore, legal heir: *See*—
Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.

Martens, Hans, deceased (by Martens, Hildegard); Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A. Method for the manufacture of a superconductive Nb,Sn layer on a niobium surface for high frequency applications.

Martens, Hans-Wolfgang, legal heir: *See*—
Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.

Martens, Harald, legal heir: *See*—
Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.

Martens, Helmut, legal heir: *See*—
Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.

Martens, Hildegard: *See*—
Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.

Martens, Rainer, legal heir: *See*—
Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.

Martens, Sigrid, legal heir: *See*—
Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.

Martens, Wolfgang: *See*—
Zimmermann, Heinz; and Martens, Wolfgang, 4,105,264, Cl. 308-20.000.

Martin, Anthony J.: *See*—
Larkworthy, Peter J.; Rose, James A.; and Martin, Anthony J., 4,104,964, Cl. 100-232.000.

Martin, Donald L.; and Yanke, David B., to Boeing Company, The. Signal selection apparatus for redundant signal sources. 4,105,900, Cl. 307-219.000.

Martin, Jerry D.: *See*—
Cammarata, Frank, III; Miller, Joe Alan; and Martin, Jerry D., 4,105,730, Cl. 264-89.000.

Martini, Fernando: *See*—
Marchesini, Bruno; and Martini, Fernando, 4,104,893, Cl. 68-5.00E.

Martinsons, Aleksandrs; and Johnson, Harlan B., to PPG Industries, Inc. Method of electrolysis. 4,105,516, Cl. 204-98.000.

Masanek, Juergen: *See*—
Pennewiss, Horst; Plainer, Hermann; Quis, Peter; Trabitzsch, Hans; Masanek, Juergen; and Jakob, Juergen, 4,105,519, Cl. 204-159.230.

Mascetti, Joseph A., to Plastofilm Industries, Inc. Package with median supporting frame and integral decorative medial band. 4,105,121, Cl. 206-592.000.

Maschinenfabrik Hennecke GmbH: *See*—
Althausen, Ferdinand; and Raffel, Reiner, 4,105,045, Cl. 137-563.000.

Maslen, John; and Taylor, William Hunter, to Imperial Chemical Industries Limited. Thermoplastic polyamide composition. 4,105,621, Cl. 260-37.00N.

Mason, Harold F. Drum stand. 4,105,178, Cl. 248-151.000.

Massey, William Moore, Jr.; and Sandukas, Theodos, to Du Pont de Nemours, E. I., and Company. Yarn treating jet moving a rotating baffle and deflector at its outlet and method of operation thereof. 4,104,770, Cl. 28-257.000.

Master Pneumatic-Detroit, Inc.: *See*—
Thrasher, George E., Jr., 4,105,095, Cl. 184-55.00A.

Masui, Hiroaki: *See*—
Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; Takeda, Tetuo; and Eiro, Seiji, 4,105,474, Cl. 148-12.00F.

Masui, Takeshi: *See*—
Yoshida, Masumi; Iwata, Kiyoshi; Yamamoto, Eiichiro; Masui, Takeshi; and Kabuyama, Yukikazu, 4,105,998, Cl. 340-146.3AC.

Masuyama, Kenichi; Sugisaki, Tsutomu; Kitamoto, Tatsuji; and Yamada, Yasuyuki, to Fuji Photo Film Co., Ltd. Magnetic head cleaning jacket. 4,106,067, Cl. 360-137.000.

Matheson, Ian Alastair, to BP Chemicals Limited. Polymerisation catalyst. 4,105,585, Cl. 252-429.00B.

Mathews, Victor M., Jr., to MKC Electronics Corporation. Proportional pulse controller. 4,105,938, Cl. 318-599.000.

Matsukane, Masamoto: *See*—
Takeno, Tsuneyuki; Iwasaki, Tetsuji; Miyamoto, Norioki; Tachibana, Kyozaburo; and Matsukane, Masamoto, 4,105,436, Cl. 71-103.000.

Matsumoto Dental College: *See*—
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Matsumoto, Isao; and Yamaguchi, Haruhisa, to Sony Corporation. Variable speed tape transport apparatus. 4,105,936, Cl. 318-328.000.
Matsumoto, Kazuya: *See*—
Tanaka, Nobuyoshi; Ayata, Naoki; Takeda, Mitsuo; Matsumura, Susumu; and Matsumoto, Kazuya, 4,105,335, Cl. 356-108.000.
Matsumoto, Nobuo: *See*—
Kakumoto, Yoshiaki; Kanegawa, Mamoru; Iwaizumi, Takashi; and Matsumoto, Nobuo, 4,105,549, Cl. 210-33.000.
Matsumoto, Susumu: *See*—
Tago, Atsuo; Yamanaka, Ryoichi; and Matsumoto, Susumu, 4,105,510, Cl. 203-14.000.
Matsumura, Susumu: *See*—
Tanaka, Nobuyoshi; Ayata, Naoki; Takeda, Mitsuo; Matsumura, Susumu; and Matsumoto, Kazuya, 4,105,335, Cl. 356-108.000.
Matsumura, Takemasa: *See*—
Matsuoka, Yoshifumi; Matsumura, Takemasa; Shigematsu, Koichi; and Oishi, Atsushi, 4,105,020, Cl. 128-2.05A.
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Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,105,781, Cl. 424-283.000.
Matsuoka, Yoshifumi; Matsumura, Takemasa; Shigematsu, Koichi; and Oishi, Atsushi, to Matsushita Electric Industrial Co., Ltd. Blood pressure and pulse rate measuring apparatus. 4,105,020, Cl. 128-2.05A.
Matsushita Electric Industrial Co., Ltd.: *See*—
Arai, Kazuo; Igarashi, Yoshiaki; Suzuki, Masaki; Sano, Nobuya; and Yosumi, Toshikazu, 4,105,935, Cl. 318-314.000.
Matsuoka, Yoshifumi; Matsumura, Takemasa; Shigematsu, Koichi; and Oishi, Atsushi, 4,105,020, Cl. 128-2.05A.
Miura, Masayoshi; Yamamori, Kiyoshi; and Mizoguchi, Akira, 4,106,032, Cl. 346-140.00R.
Miyagawa, Katsuhiko; Kunishige, Hidenori; Otsuka, Hirotaka; and Nakao, Fusafumi, 4,105,918, Cl. 250-337.000.
Nishino, Atsushi; Hayakawa, Hayashi; Yoshida, Akihiko; and Umeda, Junichiro, 4,105,513, Cl. 204-38.00A.
Sano, Nobuya; Goto, Hiroshi; and Hirota, Yutaka, 4,105,945, Cl. 330-294.000.
Shimizu, Kazuhiko, 4,105,297, Cl. 350-336.000.
Suzuki, Takashi, 4,105,737, Cl. 264-154.000.
Matsushita Seiko Co., Ltd.: *See*—
Iwasaki, Ryohei, 4,104,890, Cl. 62-324.000.
Matsushita, Taro: *See*—
Suzuki, Gyoichi; Miura, Mitsutoshi; Miyazu, Takashi; Matsushita, Taro; and Okuyama, Yasuo, 4,105,501, Cl. 201-6.000.
Matsuyama, Takeshi: *See*—
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Matthews, Donald P.: *See*—
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Matthies, Hans Georg: *See*—
Boehlke, Klaus; Welz, Martin; Foerster, Peter; Sterzel, Hans-Josef; Wurmb, Rolf; and Matthies, Hans Georg, 4,105,624, Cl. 260-40.00R.
Mattox, William J. Process for the refining of used motor oils and products thereof. 4,105,538, Cl. 208-18.000.
Mauvernay, Roland Yves; Busch, Norbert; and Moleyre, Jacques, to Centre Europeen de Recherches Mauvernay. Anti-depressive 2-methyl-4-[(3'-dimethylamino)propylidine]-9,10-dihydrobenzo [4,5]cyclohepta[1,2b]furan compounds. 4,105,785, Cl. 424-285.000.
Maxemchuk, Nicholas Frank, to RCA Corporation. Digital sampling rate conversion of color TV signal. 4,106,053, Cl. 358-13.000.
May, William E., to Gould Inc. Snap-in molded cover assembly for access opening. 4,105,136, Cl. 220-339.000.
Mayall, William. Hydraulic roller motor. 4,105,377, Cl. 418-173.000.
Maytag Company, The: *See*—
Kaldenberg, Henry J., 4,105,229, Cl. 292-113.000.
Mazurek, Edward Francis: *See*—
Gordon, Alan Mayer; Mazurek, Edward Francis; and Wright, Arden Bernard, 4,106,070, Cl. 361-42.000.
McCarter, Henry: *See*—
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McClocklin, Samuel B., to Owatonna Tool Company. Two-stage pump. 4,105,369, Cl. 417-206.000.
McClure, Charles A. Flow monitoring. 4,104,914, Cl. 73-194.00F.
McClure, Richard John: *See*—
Jeffers, Frederick John; McClure, Richard John; and Lemke, James Underwood, 4,106,028, Cl. 346-74.100.
McCollough, John D. Microplate system. 4,105,325, Cl. 355-54.000.
McConnell, Richard L.: *See*—
Weemes, Doyle A.; and McConnell, Richard L., 4,105,718, Cl. 260-889.000.
McDaniel, Max Paul, to Phillips Petroleum Company. Cycloheptatriene adjuvant for chromium oxide catalyst. 4,105,844, Cl. 526-106.000.
McDonald, David Ian: *See*—
Kellermann, Arnold LeRoy; McDonald, David Ian; and Grone, Robert Joseph, 4,104,984, Cl. 118-2.000.
McDonnell Douglas Corporation: *See*—
Quinn, Bernard W., 4,105,290, Cl. 350-168.000.
McFarland, Lellan L.: *See*—
Hayes, Richard H.; McFarland, Lellan L.; Schrum, George L.; and Vanderzee, Robert S., 4,105,488, Cl. 156-425.000.
McGhee, Thomas Allan: *See*—
Hasler, David John; and McGhee, Thomas Allan, 4,105,823, Cl. 428-307.000.
McGinn, James W., to United States Postal Service. Method for achieving accurate optical character reading of printed text. 4,105,997, Cl. 340-146.3ED.
McGinniss, Vincent D., to SCM Corporation. Ultraviolet curing of electrocoating compositions. 4,105,518, Cl. 204-159.140.
McGrath, Joseph Michael. Portable sauna. 4,105,036, Cl. 128-374.000.
McGraw-Edison Company: *See*—
Date, Kazuo H.; and Wainio, Ronald A., 4,105,878, Cl. 200-146.00R.
McIntosh, Michael D.: *See*—
Scott, Donald K., Jr.; and McIntosh, Michael D., 4,105,962, Cl. 320-32.000.
McIver, Robert T., Jr.; and Ledford, Edward B., Jr., to University of California, The Regents of the. Method and apparatus for mass spectrometric analysis at ultra-low pressures. 4,105,917, Cl. 250-291.000.
McKenzie, Eugene L., to Minnesota Mining and Manufacturing Company. Paint composition. 4,105,808, Cl. 427-137.000.
McLaren, Keir; and Wagner, Daniel William. Game apparatus. 4,105,202, Cl. 273-309.000.
McLean, Robert L.: *See*—
Greatbatch, Wilson; Mead, Ralph T.; McLean, Robert L.; Rudolph, Frank W.; and Frenz, Norbert W., 4,105,833, Cl. 429-104.000.
McNally, Sellers B.: *See*—
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McQuitty, Stanley, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity; Ontario Energy Corporation; Imperial Oil Limited; Canada-Cities Service, Ltd.; and Gulf Oil Canada Limited. System for handling the underflow from a primary separation vessel in the tar sand hot water process. 4,105,537, Cl. 208-11.0LE.
McWhirter, John H.: *See*—
Fox, Richard Q.; Millholen, James I.; and McWhirter, John H., 4,106,097, Cl. 364-492.000.
Mead Corporation, The: *See*—
Burnett, James E., 4,106,061, Cl. 358-296.000.
Mead, Ralph T.: *See*—
Greatbatch, Wilson; Mead, Ralph T.; McLean, Robert L.; Rudolph, Frank W.; and Frenz, Norbert W., 4,105,833, Cl. 429-104.000.
Means, Rodney J.: *See*—
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Mechandex Engineering (Wolverhampton) Ltd.: *See*—
Jones, Leonard Leslie, 4,106,112, Cl. 366-4.000.
Mee, Francis Herbert Arthur, to Spar Aerospace Products Limited. Grappling device. 4,105,241, Cl. 294-86.00R.
Megasystems, Inc.: *See*—
Tsipouras, Panayiotis J., 4,104,907, Cl. 73-117.300.
Megy, Joseph Allen; and Propst, Richard Lee, to Teledyne Industries, Inc. Process for regenerating a pickle acid bath. 4,105,469, Cl. 134-3.000.
Mehta, Avinash C.; Rickter, Donald O.; and Taylor, Lloyd D., to Polaroid Corporation. Process for making trimethylamine acrylimide. 4,105,694, Cl. 260-561.00H.
Mehta, Povindar Kumar, to University of California, The Regents of the. Siliceous ashes and hydraulic cements prepared therefrom. 4,105,459, Cl. 106-98.000.
Meienhofer, Johannes Arnold; and Wang, Su-Sun, to Hoffmann-La Roche Inc. Synthesis of human β-endorphin. 4,105,652, Cl. 260-112.50R.
Meier, Jean: *See*—
Allais, Andre; Meier, Jean; and Deraedt, Roger, 4,105,777, Cl. 424-274.000.
Melanson, John Laurence; Springer, Richard Allen; Grimes, Jack Duane; and Gilmore, Jack Arthur, to Tektronix, Inc. Keyboard circuit. 4,106,011, Cl. 340-365.00E.
Meloy Laboratories, Inc.: *See*—
Stahl, Quade R., 4,105,413, Cl. 23-288.00R.
Melwisch, Harald: *See*—
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Mendenhall, Robert L. Apparatus and method for producing asphalt-aggregate compositions. 4,106,110, Cl. 366-2.000.
Mendoza, Gregory E.; Henthorn, Donald Ray; and Taylor, James Franklin, to QMA Inc. Power spring compressor accessory. 4,105,188, Cl. 254-10.500.
Merck & Co., Inc.: *See*—
Bochis, Richard J.; and Tolman, Richard L., 4,105,767, Cl. 424-256.000.
Cottrell, Ian W.; Empey, Richard A.; and Racciato, Joseph S., 4,105,605, Cl. 260-17.4GC.
Jones, Howard, 4,105,660, Cl. 260-239.55C.
Racciato, Joseph S., 4,105,461, Cl. 106-205.000.
Rooney, Clarence S.; Rokach, Joshua; and Cragoe, Edward J., Jr., 4,105,769, Cl. 424-263.000.
Merix Corporation: *See*—
Mix, Thomas W., 4,105,723, Cl. 261-105.000.

Mesdan S.p.A: *See—*
Messa, Pietro, 4,105,228, Cl. 289-2.000.
Messa, Pietro, to Mesdan S.p.A. Automatic knot-forming machine for the formation of the fisherman's knot. 4,105,228, Cl. 289-2.000.
Messerschmitt-Boelkow-Blohm GmbH: *See—*
Birner, Winfried; Mueller, Hans; Listmann, Horst; and Bassner, Helmut, 4,104,875, Cl. 60-202.000.
Nissl, Norbert, 4,104,921, Cl. 73-517.00R.
Messervey, Clifford Harry: *See—*
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Mesta Machine Company: *See—*
Petros, Andrew J., 4,105,172, Cl. 242-78.100.
Metelow, Victor; and Tirenin, Ivan. Ski-sled attachment device. 4,105,217, Cl. 280-28.000.
Meuret, Fernand: *See—*
Brichard, Jean; Colery, Jean-Claude; and Meuret, Fernand, 4,105,827, Cl. 428-403.000.
Meyer, Paul L.: *See—*
Frey, William J.; and Meyer, Paul L., 4,105,226, Cl. 285-175.000.
Meyer, Rudolf: *See—*
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Meyers, George Leroy; and Kuehl, Donald Roy, to American Can Company. Packaging structure and its fabrication. 4,105,154, Cl. 229-27.000.
Micro-Mega S.A.: *See—*
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Midorikawa, Yoshio, to Glasrock Products, Inc. Method of manufacturing a marking pen having a nib and an ink reservoir integral therewith. 4,104,781, Cl. 29-419.00R.
Midrex Corporation: *See—*
Pietsch, Wolfgang B.; and Schroer, Charles A., 4,105,457, Cl. 106-78.000.
Miels, Howard J. Corner-retaining latch apparatus for doors. 4,105,232, Cl. 292-288.000.
Mihara, Kakuo: *See—*
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Mikulecky, Karel; Tyl, Miloslav; Janousek, Jan; Burysek, Frantisek; Skoda, Stanislav; and Esner, Stanislav, to Vyzkumny ustav bavlnarsky. Dynamic yarn-braking arrangement for an open-end spinning machine. 4,104,854, Cl. 57-34.00R.
Miles, Peter: *See—*
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Milianowicz, Stanislaw A.: *See—*
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Miller, George A.; and Carley, Harold E., to Rohm and Haas Company. Metal salt complexes of 1-substituted aralkyl imidazoles, and methods and compositions for controlling phytopathogenic fungi using them. 4,105,762, Cl. 424-245.000.
Miller, George A.: *See—*
Lewis, Sheldon N.; Miller, George A.; and Law, Andrew B., 4,105,431, Cl. 71-67.000.
Miller, Glynn; and Stephenson, James E., to Albright & Wilson Limited. Dispersion for timber treatment. 4,105,566, Cl. 252-8.100.
Miller, Herman P., III. Narrow band transmission system and method. 4,105,870, Cl. 179-15.55R.
Miller, Jack V., to Killerwatt Corp. Lampholder-socket for circline fluorescent lamp. 4,105,276, Cl. 339-95.00D.
Miller, James Clayton; and Proefrock, Paul R., to Sargent & Greenleaf, Inc. Padlock having wedge device for resisting destructive wedge attack. 4,104,894, Cl. 70-52.000.
Miller, Joe Alan: *See—*
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Miller, Myrl J.: *See—*
Gibson, David Kent; Miller, Myrl J.; and Snell, Spencer Allan, 4,105,327, Cl. 355-59.000.
Miller, Robert; and Grundy, Paul L., to NCR Corporation. Circuit module. 4,106,076, Cl. 361-394.000.
Millers, Donald Alexander, II., to Burroughs Corporation. Interface system providing interfaces to central processing unit and modular processor-controllers for an input-output subsystem. 4,106,092, Cl. 364-200.000.
Millholen, James I.: *See—*
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Mills, Loring K., to Polaroid Corporation. Camera having multizone shutter mechanism. 4,106,034, Cl. 354-31.000.
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corporation. 2,2,6,6-Tetramethyl-4-piperidyl carboxylic acid esters of hydroxy aliphatic di- and tri-carboxylic acids as light stabilizers for synthetic polymers. 4,105,625, Cl. 260-45.80N.
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, to Argus Chemical Corporation. Synthetic resin stabilizer comprising a thioether ester and hindered phenolic carbonate. 4,105,629, Cl. 260-45.8NT.
Minnesota Mining and Manufacturing Company: *See—*
Conder, Terrence M.; and Jones, Terence A., 4,105,292, Cl. 350-211.000.
Huffman, William A.; and Brown, Harvey A., 4,105,299, Cl. 350-349.000.
McKenzie, Eugene L., 4,105,808, Cl. 427-137.000.
Thom, Karl Friedrich, 4,105,667, Cl. 260-299.000.
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Murata, Tomoji; Shibazaki, Kenji; Nakamura, Yoshihiro; and Kuse, Matsuo, 4,105,914, Cl. 235-92.0SB.
Mirman, Serge. Display device. 4,104,810, Cl. 35-53.000.
Mishina, Haruo; Sanobe, Kazuhiro; and Fujie, Kunio, to Hitachi, Ltd. Fluid rotary machine. 4,105,372, Cl. 417-243.000.
Miskovic, Mihajlo (Michel): *See—*
Sigwalt, Pierre; Polton, Alain; Baudin, Cecile; and Miskovic, Mihajlo (Michel), 4,105,713, Cl. 260-879.000.
Mitchell, Joseph, Jr.: *See—*
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Mitsubishi Chemical Industries Ltd.: *See—*
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Mitsui Petrochemical Industries Ltd.: *See—*
Iwase, Yoshiyuki; Katayama, Shigeru; and Nakano, Takayuki, 4,105,843, Cl. 526-77.000.
Mitsui Toatsu Chemicals Inc.: *See—*
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Mitsuya, Kinpei: *See—*
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Miura, Masayoshi; Yamamori, Kiyoshi; and Mizoguchi, Akira, to Matsushita Electric Industrial Co., Limited. Apparatus for applying liquid droplets to a surface by using a high speed laminar air flow to accelerate the same. 4,106,032, Cl. 346-140.00R.
Miura, Mitsutoshi: *See—*
Suzuki, Gyoichi; Miura, Mitsutoshi; Miyazu, Takashi; Matsushita, Taro; and Okuyama, Yasuo, 4,105,501, Cl. 201-6.000.
Mix, Thomas W., to Merix Corporation. Vapor-liquid contacting. 4,105,723, Cl. 261-105.000.
Miyagawa, Katsuhiko; Kunishige, Hidenori; Otsuka, Hirotaka; and Nakao, Fusafumi, to Matsushita Electric Industrial Co., Ltd. Thermoluminescent type radiation dosimeter readout apparatus. 4,105,918, Cl. 250-337.000.
Miyamoto, Norioki: *See—*
Takeno, Tsuneyuki; Iwasaki, Tetsuji; Miyamoto, Norioki; Tachibana, Kyozaburo; and Matsukane, Masamoto, 4,105,436, Cl. 71-103.000.
Miyatuka, Hajime; Saida, Takashi; and Honjo, Satoru, to Fuji Photo Film Co., Ltd. Electrophotographic photosensitive layer and marking method. 4,105,448, Cl. 96-1.800.
Miyazaki, Tsutomu; Yoshizawa, Toshio; Yoshida, Yoshiaki; Mitsuya, Kinpei; and Ogasawara, Takeshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Arrangement for providing transfer tail windings on a bobbin. 4,105,165, Cl. 242-18.0PW.
Miyazu, Takashi: *See—*
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Mizoguchi, Akira: *See—*
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Mizuno, William G., to Economics Laboratory, Inc. Treatment of fabrics in machine dryers. 4,105,813, Cl. 428-76.000.
Mizutani, Yoshihisa: *See—*
Shinozaki, Satoshi; Nishi, Yoshio; and Mizutani, Yoshihisa, 4,106,049, Cl. 357-46.000.
MKC Electronics Corporation: *See—*
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Mobil Oil Corporation: *See—*
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Davis, Kenneth G.; Due, George B.; and Lund, Albert H., 4,105,614, Cl. 260-29.40R.
Haase, Donald A.; and Reed, Robert E., 4,105,491, Cl. 156-553.000.
Peters, Alan W., 4,105,535, Cl. 208-8.000.
Plank, Charles J.; Rubin, Mae K.; and Rosinski, Edward J., 4,105,541, Cl. 208-111.000.
Rohn, Charles L., 4,105,738, Cl. 264-163.000.
Stournas, Stamoulis; and Dickert, Joseph J., Jr., 4,105,570, Cl. 252-8.55D.
Mobley, Della: *See—*
Mobley, Robert L.; and Mobley, Della, 4,105,968, Cl. 324-133.000.
Mobley, Robert L.; and Mobley, Della, to Raymond Lee Organization, Inc., The. Electrical tester having retractable prongs and a retractable test rod for indicating presence of a voltage. 4,105,968, Cl. 324-133.000.
Mocek, Karel: *See—*
Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, 4,105,744, Cl. 423-239.000.
Mochimaru, Hideaki, to Ricoh Company, Ltd. Electrophotographic copying machines of variable magnification. 4,105,326, Cl. 355-55.000.
Mochimaru, Masayoshi. Device for suppressing ignition noise. 4,105,007, Cl. 123-148.00P.

Moeckel, Robert: *See—*
Erickson, Charles R.; Hingarh, Hemraj K.; Moeckel, Robert; and Wilnai, Dan, 4,106,090, Cl. 364-200.000.
Mohin, Terry Martin: *See—*
Marshall, Denis John; and Mohin, Terry Martin, 4,105,887, Cl. 219-72.000.
Mohnhaupt, Dietrich Fritz Arthur. Fuels for internal combustion engines. 4,105,418, Cl. 44-78.000.
Molday, Robert S.: *See—*
Yen, Shiao-Ping S.; Rembaum, Alan; and Molday, Robert S., 4,105,598, Cl. 521-53.000.
Moleyre, Jacques: *See—*
Mauvernay, Roland Yves; Busch, Norbert; and Moleyre, Jacques, 4,105,785, Cl. 424-285.000.
Moll, Manfred, to Rheinmetall GmbH. Arrangement for improving the burning efficiency of a rocket-borne solid propellant charge cartridge. 4,104,969, Cl. 102-49.300.
Mollet, Hans: *See—*
Koci, Zdenek; and Mollet, Hans, 4,105,401, Cl. 8-79.000.
Molt, Jurgen: *See—*
Hagenlocher, Walter; Neumann, Karl-Heinz; Muller, Martin; Kleebaur, Karl; Sokol, Gunter; and Molt, Jurgen, 4,105,907, Cl. 310-232.000.
Momono, Masakichi: *See—*
Hohsho, Yukio; Karino, Kimiji; Momono, Masakichi; Oyama, Yoshishige; Yamauchi, Teruo; and Teranishi, Takao, 4,105,720, Cl. 261-34.00A.
Momovis B.V.: *See—*
Hodge, Jonathan Martin, 4,105,378, Cl. 418-195.000.
Monnier, Denys; and Bolle, Pierre, to Etzlinger, Lucien; Koelker, Carl Wilhelm; Grossman, Claus H.; and Multi-Marketing Services AG. Method and reagent for determining the ethyl alcohol content of a gas. 4,105,409, Cl. 23-232.00R.
Monsanto Company: *See—*
Dyroff, David R.; and Suchanek, Walton F., Jr., 4,105,756, Cl. 424-48.000.
Gaertner, Van R., 4,105,432, Cl. 71-86.000.
Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Treatment of sulfide-limed pelts in acid baths. 4,105,402, Cl. 8-94.170.
Monte, Robert W., to Nashua Corporation. Starch-dextrine-polyacrylamide adhesive and tape. 4,105,824, Cl. 428-355.000.
Montedison S.p.A.: *See—*
Zanella, Giuseppe; and Mancini, Luciano, 4,105,727, Cl. 264-12.000.
Moody, Asa Carlyle, Jr.; Kenward, Richard George; and Shiver, James William, to Allied Chemical Corporation. Computer controlled apparatus for preparation of polyethylene terephthalate. 4,106,098, Cl. 364-500.000.
Moore, Barnard J., to Bayfront Carpet and Vacuum, Inc. Canister vacuum cleaner with transparent lid. 4,105,420, Cl. 55-274.000.
Moore Business Forms Inc.: *See—*
Neale, David John; and Perriman, Victor Herbert, 4,105,225, Cl. 282-27.500.
Moore, James E. Inclined conical rotary vessels for storage and tumbling of materials to accomplish mixing and heat transfer. 4,106,114, Cl. 366-131.000.
Moore, John Howard: *See—*
Cockshott, Charles Peter; and Moore, John Howard, 4,104,913, Cl. 73-194.00F.
Moore, Robert E.; and Clark, Leland C., Jr., to Sun Ventures, Inc.; and Children's Hospital Medical Center. Perfluoro polycyclic compounds for use as synthetic blood and perfusion media. 4,105,798, Cl. 424-352.000.
Moore, Thomas F., to Atlantic Richfield Company. Solution mining of minerals from vertically spaced zones. 4,105,252, Cl. 299-4.000.
Moraw, Roland; and Schadlich, Gunther, to Hoechst Aktiengesellschaft. Process and apparatus for recording deformation images. 4,105,323, Cl. 355-9.000.
Morbey, Graham Kenneth: *See—*
Chatterjee, Pronoy Kumar; and Morbey, Graham Kenneth, 4,105,033, Cl. 128-285.000.
Morch, Ole Christian, to Stickma A/S. Apparatus for insertion of sticks in ice cream bodies. 4,105,384, Cl. 425-126.00S.
Morehead, William R.: *See—*
Horn, John H.; Morehead, William R.; Hurst, Ronald C.; Potter, Dennis J.; and Schaub, Clyde D., 4,105,750, Cl. 423-456.000.
Morgan, Thomas E., Jr., to Friedman, Leonard. Brake shoe lining bonding fixture. 4,104,961, Cl. 100-93.0PB.
Mori, Keiichi: *See—*
Numata, Yasumasa; Ito, Kunio; Mori, Keiichi; and Ono, Yoshitami, 4,105,453, Cl. 96-114.500.
Mori, Sanae, to Daido Metal Company, Ltd. Bearing provided with oblique oil grooves and/or with a plurality of obliquely arranged rows of semicircular indentations. 4,105,267, Cl. 308-240.000.
Morinaga, Shigeki: *See—*
Takahashi, Tadashi; Morinaga, Shigeki; and Kubokura, Kuniaki, 4,104,978, Cl. 112-277.000.
Morishita, Michio: *See—*
Saito, Haruhiko; and Morishita, Michio, 4,105,719, Cl. 261-34.00B.
Moritz, Werner, to Kabelschlepp Gesellschaft mit beschrankter Haftung. Energy conducting chain. 4,104,871, Cl. 59-78.100.
Mormino, Vittorio: *See—*
Balducci, Agostino; Corbellini, Margherita; Mormino, Vittorio; Notari, Bruno; and Rivola, Luigi, 4,105,588, Cl. 252-454.000.
Morrell, Jacque C. Processes including the production of non-congealing shale oil from oil shales. 4,105,536, Cl. 208-11.00R.
Morrey, John R.: *See—*
Bartlett, Rodney J.; and Morrey, John R., 4,105,921, Cl. 250-423.00P.
Morris, Harold K., Jr. Dispensing device for fluid substances. 4,105,142, Cl. 222-158.000.
Morton-Norwich Products, Inc.: *See—*
Schwan, Thomas J.; and White, Ralph L., Jr., 4,105,850, Cl. 548-319.000.
Moser, Robert E.: *See—*
Paudler, William W.; Moser, Robert E.; and Pollack, Norman M., 4,105,434, Cl. 71-93.000.
Moser, William R., to Exxon Research & Engineering Co. Hydrodesulfurization catalyst. 4,105,589, Cl. 252-462.000.
Moss Rosenberg Verft A/S: *See—*
Kvamsdal, Rolf, 4,104,887, Cl. 62-45.000.
Mosse, Richard Wolfgang Emil, to Liquid Packaging Holdings Limited. Container sealing apparatus. 4,104,849, Cl. 53-379.000.
Motoren- und Turbinen-Union Friedrichshafen GmbH: *See—*
Zeidler, Gunter; and Gunther, Christian, 4,105,092, Cl. 184-6.400.
Motorola, Inc.: *See—*
Fitting, Robert C.; and Piesinger, Gregory H., 4,105,977, Cl. 325-472.000.
Henry, Paul Michael, 4,105,942, Cl. 330-261.000.
Hepworth, Edward C.; and Means, Rodney J., 4,106,091, Cl. 364-200.000.
Padgitt, Kenneth Warren, 4,104,997, Cl. 123-117.00R.
Motta, Raimondo, to Oxon Italia S.p.A. Continuous process for the production of cyclohexyl magnesium halides. 4,105,703, Cl. 260-665.00G.
Movchan, Boris Alexeevich; Timashov, Viktor Alexandrovich; and Kljuev, Konstantin Nikolaevich. Device for electron-beam heating of materials. 4,105,890, Cl. 219-121.0EB.
Mueller, Hans: *See—*
Birner, Winfried; Mueller, Hans; Listmann, Horst; and Bassner, Helmut, 4,104,875, Cl. 60-202.000.
Mueller, Martin S.: *See—*
Carter, William D.; and Mueller, Martin S., 4,105,329, Cl. 355-91.000.
Mukaiyama, Teruaki; Usui, Masahiro; and Saigo, Kazuhiko, to Sumitomo Chemical Company, Limited. Process for the preparation of lactones. 4,105,673, Cl. 260-343.000.
Mulkens, Casper Antonius Henricus, administrator: *See—*
Bertrams, Johannes Kurt, deceased; and Mulkens, Casper Antonius Henricus, administrator, 4,105,099, Cl. 191-29.0DM.
Muller, Albert; and Schreiner, John M., to Treadwell Corp. Process for removing cyanide-containing components from aqueous media. 4,105,545, Cl. 210-15.000.
Muller, Erwin; and Thomas, Heinz, to Bayer Aktiengesellschaft. Nitrogen containing chemical compounds and a process for making polyurethanes with the new compounds as a catalyst. 4,105,600, Cl. 521-129.000.
Muller, Hans. Preparation of sterile products. 4,105,550, Cl. 210-50.000.
Muller, Martin: *See—*
Hagenlocher, Walter; Neumann, Karl-Heinz; Muller, Martin; Kleebaur, Karl; Sokol, Gunter; and Molt, Jurgen, 4,105,907, Cl. 310-232.000.
Mullin, Charles R.; and Perettie, Donald J., to Dow Chemical Company, The. Method for preparing halogenated alkanes and alkenes. 4,105,702, Cl. 260-658.00R.
Multi-Marketing Services AG.: *See—*
Monnier, Denys; and Bolle, Pierre, 4,105,409, Cl. 23-232.00R.
Murakami, Toshiaki; Waku, Shigeru; Demura, Akira; and Fujishiro, Toshiaki, to Nippon Telegraph & Telephone Public Corporation; and Nippon Tsushin Kogyo Kabushiki Kaisha. Ceramic material of low thermal expansion coefficient and method of manufacturing the same. 4,105,456, Cl. 106-46.000.
Murakami, Tudoi: *See—*
Tuda, Goro; Shimizu, Katsuhiko; Murakami, Tudoi; and Nasu, Syouzi, 4,105,937, Cl. 318-568.000.
Murata, Akira: *See—*
Ishimatsu, Kazuhiko; Nakahara, Takao; Murata, Akira; and Kuroki, Masami, 4,105,192, Cl. 266-149.000.
Murata, Tomoji; Shibazaki, Kenji; Nakamura, Yoshihiro; and Kuse, Matsuo, to Minolta Camera Kabushiki Kaisha. Presetting counter device. 4,105,914, Cl. 235-92.0SB.
Murphy, John R. Compressed air-operated motor employing an air distributor. 4,104,955, Cl. 91-176.000.
Murray, Glen W.: *See—*
Wolfshagen, Ronald G.; Ypma, John E.; Murray, Glen W.; and Chen, Thomas T., 4,106,106, Cl. 365-2.000.
Murray, W. Bruce. Method of inhibiting corrosion using a hexametaphosphate and a phosphate buffer. 4,105,406, Cl. 21-2.70R.
Mx-Processer Reinhardt & Co. AB: *See—*
Reinhardt, Hans; Ottertun, Harald Daniel; and Andersson, Sven Otto Sigbert, 4,105,743, Cl. 423-24.000.
Myers, William N.; and Hein, Leopold A., to United States of America, National Aeronautics and Space Administration. Spherical bearing. 4,105,261, Cl. 308-72.000.
N L Industries, Inc.: *See—*
Finlayson, Claude Malcolm; and Jordan, John W., 4,105,578, Cl. 252-316.000.
Naef, Frederick E., to United States of America, Navy. Mass transport heat exchanger method and apparatus for use in ocean thermal energy exchange power plants. 4,104,883, Cl. 60-641.000.

Nagaitsev, Vladimir Alexandrovich: *See—*
Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.

Naganawa, Hiroshi: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,105,658, Cl. 260-239.30T.

Nagano, Saburo: *See—*
Koga, Kazunori; and Nagano, Saburo, 4,105,455, Cl. 106-44.000.

Nagatamo, Jiro: *See—*
Yasuda, Hiroshi; Tani, Katsuya; and Nagatamo, Jiro, 4,105,740, Cl. 264-290.00T.

Nagumo, Fumio; and Yamanaka, Seisuke, to Sony Corporation. Solid state CCD cameras having phase adjustment of luminance and chrominance components. 4,106,056, Cl. 358-50.000.

Nagy, Gabor: *See—*
Sciola, Joseph; and Nagy, Gabor, 4,105,171, Cl. 242-68.400.

Nagy, Nee Zsuzsanna: *See—*
Szejtli, Jozsef; Dosa, Eva; Tassonyi, Edomer; David, Agoston; and Nagy, Nee Zsuzsanna, 4,105,760, Cl. 424-180.000.

Naito, Han-Ichiro. Wall constructing method and wall constructed thereby. 4,104,837, Cl. 52-173.00R.

Naka, Reishi; and Narahara, Toshikazu, to Hitachi, Ltd. Process for producing rigid polyurethane foam. 4,105,599, Cl. 521-131.000.

Nakagawa, Yasuharu, to Topla, Inc. Marble-patterned bathtub, basin or sink. 4,105,734, Cl. 264-132.000.

Nakahara, Takao: *See—*
Ishimatsu, Kazuhiko; Nakahara, Takao; Murata, Akira; and Kuroki, Masami, 4,105,192, Cl. 266-149.000.

Nakahara, Yutaka: *See—*
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,105,629, Cl. 260-45.8NT.

Nakajima, Takamitsu, to Tomy Kogyo Co., Inc. Toy telephone with bell and recorded messages. 4,104,821, Cl. 46-33.000.

Nakamoto, Soichi; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. System for indicating photographing conditions. 4,106,033, Cl. 354-23.00D.

Nakamura, Junichi; Konuma, Hiroshi; Kokuryo, Shiro; Ueshima, Takashi; and Tsuge, Chutatsu, to Showa Denko K.K. High impact composition of ring-opening polymerization product. 4,105,608, Cl. 260-23.00R.

Nakamura, Katsuhiro, to Nippon Electric Co., Ltd. Parallel-processing error correction system. 4,105,999, Cl. 340-146.1AL.

Nakamura, Kotaro; Ichijima, Seiji; Furutachi, Nobuo; and Kosuge, Yosio, to Fuji Photo Film Co., Ltd. Process for preparing 3-N-monosubstituted amino-4-substituted-5-pyrazolones. 4,105,656, Cl. 260-239.900.

Nakamura, Michiaki: *See—*
Yoda, Kazuhiro; and Nakamura, Michiaki, 4,104,861, Cl. 58-38.00R.

Nakamura, Shigeki: *See—*
Tanei, Tadayoshi; Nakamura, Shigeki; and Hotta, Masahiro, 4,105,449, Cl. 96-1.800.

Nakamura, Shinji: *See—*
Owaki, Isao; Nakamura, Shinji; and Tsuchikane, Yoshiyuki, 4,105,213, Cl. 274-38.000.

Nakamura, Yoshihiro: *See—*
Murata, Tomoji; Shibazaki, Kenji; Nakamura, Yoshihiro; and Kuse, Matsuo, 4,105,914, Cl. 235-92.0SB.

Nakamurz, Zenzo; and Hasegawa, Goro, to Canon Kabushiki Kaisha. Flash device for use with a camera. 4,106,037, Cl. 354-128.000.

Nakanishi, Susumu, to Pfizer Inc. Process for 6-amino-2,2-dimethyl-3-(5-tetrazolyl)penam. 4,105,668, Cl. 260-306.70R.

Nakano, Takayuki: *See—*
Iwase, Yoshiyuki; Katayama, Shigeru; and Nakano, Takayuki, 4,105,843, Cl. 526-77.000.

Nakao, Fusafumi: *See—*
Miyagawa, Katsuhiko; Kunishige, Hidenori; Otsuka, Hirotaka; and Nakao, Fusafumi, 4,105,918, Cl. 250-337.000.

Nakaoka, Ichiro: *See—*
Ando, Wataru; and Nakaoka, Ichiro, 4,105,520, Cl. 204-162.00R.

Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; Takeda, Tetuo; and Eiro, Seiji, to Nippon Steel Corporation. Process for producing a high tension steel sheet product having an excellent low-temperature toughness with a yield point of 40 kg/mm^2 or higher. 4,105,474, Cl. 148-12.00F.

Nalco Chemical Company: *See—*
Weinland, Billy W., 4,105,540, Cl. 208-48.0AA.

Nalco-Hakuto Chemical Company: *See—*
Oguro, Yoshiharu, 4,105,582, Cl. 252-392.000.

Narahara, Toshikazu: *See—*
Naka, Reishi; and Narahara, Toshikazu, 4,105,599, Cl. 521-131.000.

Nashua Corporation: *See—*
Monte, Robert W., 4,105,824, Cl. 428-355.000.

Naslund, Edwin N.; and MacDonald, Ian, to Cal-Wood Door. Solid door having edges of laminated pressed wood fiber sheet material. 4,104,828, Cl. 49-399.000.

Naslund, Rolf Paul; Ahrbom, Karl Bertil; and Margen, Peter Heinrich Erwin, to Aktiebolaget Atomenergi. Method of winding a tube coil, and an arrangement for performing said method. 4,105,389, Cl. 425-392.000.

Nasu, Rikuo: *See—*
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, 4,105,435, Cl. 71-94.000.

Nasu, Syouzi: *See—*
Tuda, Goro; Shimizu, Katsuhiko; Murakami, Tudoi; and Nasu, Syouzi, 4,105,937, Cl. 318-568.000.

Nathanson, Harvey C.; and Sopira, Michael M., to Westinghouse Electric Corp. Radiant energy sensor. 4,106,046, Cl. 357-30.000.

National Institute for Metallurgy, The: *See—*
Edwards, Roderick I.; and Nattrass, Michael J., 4,105,742, Cl. 423-22.000.
Fieberg, Monika M.; and Edwards, Roderick I., 4,105,442, Cl. 75-101.0BE.

National Research Development Corporation: *See—*
Culshaw, Brian, 4,106,043, Cl. 357-13.000.
Johnson, Alan Stanley William; and Tseung, Alfred Chan Chung, 4,105,530, Cl. 204-290.00R.
Whittingham, Thomas Anthony; and Farmery, Michael John, 4,104,923, Cl. 73-646.000.

National Semiconductor Corporation: *See—*
Klein, Thomas, 4,104,784, Cl. 29-571.000.

Nattrass, Michael J.: *See—*
Edwards, Roderick I.; and Nattrass, Michael J., 4,105,742, Cl. 423-22.000.

Naylor, Floyd E., to Phillips Petroleum Company. Copolymerization of isomonoolefins with conjugated dienes. 4,105,845, Cl. 526-117.000.

Naz, Paul. Roofing or siding slat assembly with protective hinge-forming groove. 4,104,841, Cl. 52-519.000.

NCR Corporation: *See—*
Coleman, William E., 4,105,930, Cl. 315-169.0TV.
Fussbender, Charles J., 4,106,109, Cl. 365-238.000.
Miller, Robert; and Grundy, Paul L., 4,106,076, Cl. 361-394.000.
Sanders, David E.; Chambers, Ramon P.; and Gordy, Robert S., 4,105,975, Cl. 325-320.000.

Neale, David John; and Perriman, Victor Herbert, to Moore Business Forms Inc. Autographic register systems. 4,105,225, Cl. 282-27.500.

Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek: *See—*
De Jong, Jan, 4,105,822, Cl. 428-216.000.

Nels, Terry E., to General Motors Corporation. Process for making metal fibers. 4,104,900, Cl. 72-70.000.

Nels, Terry E., to General Motors Corporation. Clutch and damper assembly. 4,105,102, Cl. 192-106.100.

Nelsson, Nels, to United States Gypsum Company. Apparatus for kerfing gypsum wallboard. 4,104,938, Cl. 83-5.000.

Nemeth, Henry: *See—*
Cooper, Julius; Carella, Vincent; Nielsen, Edwin; and Nemeth, Henry, 4,105,207, Cl. 273-89.000.

Netherton, Charles F.: *See—*
Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., 4,104,787, Cl. 29-596.000.

Netstal-Maschinen AG: *See—*
Laimer, Friedrich; and Roth, Bernhard, 4,106,113, Cl. 366-79.000.

Neumann, Karl-Heinz: *See—*
Hagenlocher, Walter; Neumann, Karl-Heinz; Muller, Martin; Kleebaur, Karl; Sokol, Gunter; and Molt, Jurgen, 4,105,907, Cl. 310-232.000.

Nevalainen, Harri. Permeability responsive oscillator for detecting phase transformations at various cooling rates. 4,105,971, Cl. 324-203.000.

New England Power Service Company: *See—*
Johnston, Reed H.; Jeffreys, Dennis C.; and Stratton, Lawrence J., 4,106,007, Cl. 340-310.00A.
Stratton, Lawrence J.; Jeffreys, Dennis C.; Welz, Albert W., Jr.; and Johnston, Reed H., 4,105,897, Cl. 307-3.000.

Newell, George. Portable pallet carriers. 4,105,218, Cl. 280-43.120.

Newton, Cecil A., to El Paso Products Company. Recovery process for aqueous waste streams in adipic acid systems. 4,105,856, Cl. 560-191.000.

Newton, Richard C.; and Romanek, Gerald A., to Phillips Petroleum Company. Infrared apparatus for producing a fused fabric. 4,105,484, Cl. 156-380.000.

Nicco, Adrien; and Machon, Jean-Pierre, to Societe Chimique des Charbonnages-CdF Chimie. High pressure ethylene polymerization using catalysts of the ziegler type. 4,105,842, Cl. 526-65.000.

Nicolas, Yves; and Landaud, Andre, to Schlumberger Technology Corporation. Methods and apparatus for determining the stuck point of a conduit in a borehole. 4,105,071, Cl. 166-250.000.

Nicolas, Yves: *See—*
Lavigne, Jean C.; and Nicolas, Yves, 4,104,911, Cl. 73-151.000.
Lavigne, Jean C.; Nicolas, Yves; and Landaud, Andre, 4,105,070, Cl. 166-250.000.

Nicolayczik, Hans, to American Standard Inc. Faucet valve. 4,105,043, Cl. 137-454.200.

Nielsen, Edwin: *See—*
Cooper, Julius; Carella, Vincent; Nielsen, Edwin; and Nemeth, Henry, 4,105,207, Cl. 273-89.000.

Nielsen, Verner; and Rasmussen, Hobert Manfred, to Rockwool International A/S. Apparatus for manufacture of mineral wool. 4,105,425, Cl. 65-14.000.

Niizeki, Kiyoshi: *See—*
Ohno, Toshiaki; and Niizeki, Kiyoshi, 4,105,809, Cl. 427-164.000.

Nijman, John Peter, to Bunker Ramo Corporation. Antenna mounting base. 4,106,024, Cl. 343-715.000.

Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; Umemoto, Sueo; and Suzuki, Kisaku, to Kansai Paint Company, Limited. Process for

treating the surface of aluminum or aluminum alloy. 4,105,511, Cl. 204-38.00A.

Niles Parts Co., Ltd.: *See—*
Shimizu, Akio, 4,105,996, Cl. 340-73.000.

Nipki po Tzvetna Metalurgia: *See—*
Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.

Nippon Electric Co., Ltd.: *See—*
Hayashi, Izuo; and Lang, Roy, 4,105,955, Cl. 331-94.50H.
Kage, Kouzou, 4,105,979, Cl. 328-164.000.
Nakamura, Katsuhiro, 4,105,999, Cl. 340-146.1AL.
Sato, Kazukiyo; Takahashi, Katuo; Kubota, Junjiro; and Tsuchiya, Keiji, 4,105,199, Cl. 271-122.000.
Shiba, Hiroshi; and Kani, Kenji, 4,104,785, Cl. 29-574.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Yoshida, Takashi; Kosugi, Masao; and Matsuyama, Takeshi, 4,106,044, Cl. 357-22.000.

Nippon Kogaku K.K.: *See—*
Kuroha, Noboru, 4,105,338, Cl. 356-118.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Suzuki, Gyoichi; Miura, Mitsutoshi; Miyazu, Takashi; Matsushita, Taro; and Okuyama, Yasuo, 4,105,501, Cl. 201-6.000.

Nippon Konbeya Kabushiki Kaisha: *See—*
Asakawa, Akira, 4,106,005, Cl. 340-676.000.

Nippon Mining Company: *See—*
Ishimatsu, Kazuhiko; Nakahara, Takao; Murata, Akira; and Kuroki, Masami, 4,105,192, Cl. 266-149.000.

Nippon Paint Co., Ltd.: *See—*
Hori, Kiyoshi, 4,105,816, Cl. 428-159.000.

Nippon Prosensor Co., Ltd.: *See—*
Otani, Hiroaki, 4,106,003, Cl. 340-530.000.

Nippon Steel Corporation: *See—*
Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; Takeda, Tetuo; and Eiro, Seiji, 4,105,474, Cl. 148-12.00F.

Nippon Telegraph & Telephone Public Corporation: *See—*
Murakami, Toshiaki; Waku, Shigeru; Demura, Akira; and Fujishiro, Toshiaki, 4,105,456, Cl. 106-46.000.

Nippon Tsushin Kogyo Kabushiki Kaisha: *See—*
Murakami, Toshiaki; Waku, Shigeru; Demura, Akira; and Fujishiro, Toshiaki, 4,105,456, Cl. 106-46.000.

Nippon Zeon Co., Ltd.: *See—*
Yamazaki, Masahiro, 4,105,731, Cl. 264-94.000.

Nippondenso Co., Ltd.: *See—*
Ito, Mikiji, 4,104,880, Cl. 60-290.000.

Nishi, Yoshio, to Agency of Industrial Science and Technology, The President of the. Field effect transistors. 4,106,045, Cl. 357-23.000.

Nishi, Yoshio: *See—*
Shinozaki, Satoshi; Nishi, Yoshio; and Mizutani, Yoshihisa, 4,106,049, Cl. 357-46.000.

Nishida, Takashi: *See—*
Fujita, Yoshiji; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,105,700, Cl. 568-875.000.

Nishino, Atsushi; Hayakawa, Hayashi; Yoshida, Akihiko; and Umeda, Junichiro, to Matsushita Electric Industrial Co., Limited. Solid electrolyte capacitor having metallic cathode collector in direct contact with manganese dioxide electrolyte and method of producing same. 4,105,513, Cl. 204-38.00A.

Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, to Ishihara Sangyo Kaisha Ltd. Herbicidal compound, herbicidal composition containing the same, and method of use thereof. 4,105,435, Cl. 71-94.000.

Nissan Motor Company, Ltd.: *See—*
Fujishiro, Takeshi; Wazawa, Kiyoshi; and Oguro, Takeshi, 4,105,524, Cl. 204-195.00S.
Iijima, Tetsuya, 4,105,100, Cl. 192-.034.
Oda, Takaaki; and Takeuchi, Kazuo, 4,105,223, Cl. 280-752.000.
Ono, Katsutoshi; and Sekiguchi, Koichi, 4,104,981, Cl. 116-124.00L.

Nissl, Norbert, to Messerschmitt-Boelkow-Blohm GmbH. Piezoelectric acceleration transducer. 4,104,921, Cl. 73-517.00R.

Nitta, Atsushi; and Haida, Hirotoshi, to Panafacom Limited. Data transferring system with priority control and common bus. 4,106,104, Cl. 364-900.000.

Nobel Hoechst Chimie: *See—*
Christidis, Yani; and Schouteten, Alain, 4,105,690, Cl. 260-519.000.

Noguchi, Shunsaku; Takei, Saburo; and Kawano, Yasuhiko, to Takeda Chemical Industries, Ltd. Spiro[cyclopropane-1,2'-indolin]-3'-ones. 4,105,670, Cl. 260-326.11R.

Nohira, Hidetaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Secondary air supply system for an internal combustion engine. 4,104,879, Cl. 60-290.000.

Noormets, Elmar: *See—*
Disch, Gunther; and Noormets, Elmar, 4,105,398, Cl. 432-121.000.

Norback, Hakan Nils; and Asp, Benkt Goran Rurik, to KemaNobel AB. Process for preparing a dispersion. 4,105,584, Cl. 252-426.000.

Noren, Stephen E.: *See—*
Friedenberg, Robert M.; Yoscak, John L.; and Noren, Stephen E., 4,105,522, Cl. 204-195.00B.

Norfin, Inc.: *See—*
Orth, George Otto, Jr., 4,105,611, Cl. 260-27.0EV.

Norris, Alan H.: *See—*
Chambley, Phillip W.; and Norris, Alan H., 4,104,855, Cl. 57-77.300.

Notari, Bruno: *See—*
Balducci, Agostino; Corbellini, Margherita; Mormino, Vittorio; Notari, Bruno; and Rivola, Luigi, 4,105,588, Cl. 252-454.000.

Novotny, David R.: *See—*
Bothof, Delwin L.; Fowles, Richard G.; Heinzl, Johann J.; Novotny, David R.; Weisickle, Robert L.; Wetzel, John H.; and Winninghoff, Paul G., 4,105,995, Cl. 340-146.10E.

NRM Corporation: *See—*
Cantarutti, Armindo, 4,105,486, Cl. 156-405.00R.

Nudelman, Boris Vladimirovich: *See—*
Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.

Nulph, Robert J.: *See—*
Anderson, Arnold L.; and Nulph, Robert J., 4,105,632, Cl. 260-45.75D.

Numata, Yasumasa; Ito, Kunio; Mori, Keiichi; and Ono, Yoshitami, to Konishiroku Photo Industry Co., Ltd. Colored light-sensitive silver halide photographic material with coating additive. 4,105,453, Cl. 96-114.500.

Nuttall, Roy: *See—*
Dormer, Leslie; and Nuttall, Roy, 4,106,051, Cl. 357-71.000.

Nychka, Henry R.: *See—*
Sweeney, Richard F.; Peterson, James O.; Sukornick, Bernard; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,105,691, Cl. 260-530.00R.

O.M.V. S.p.A.: *See—*
Padovani, Pietro, 4,105,736, Cl. 264-153.000.

Oakes, Vincent: *See—*
Hutton, Ronald E.; Oakes, Vincent; and Burley, Joseph, 4,105,684, Cl. 260-429.700.

Oberheim, Robert: *See—*
Karey, Hans; Oberheim, Robert; and Heintke, Hans-Eberhard, 4,106,080, Cl. 362-18.000.

Occidental Oil Shale: *See—*
Cha, Chang Yul, 4,105,072, Cl. 166-261.000.

Occidental Petroleum Corporation: *See—*
Choi, Charles K., 4,105,502, Cl. 201-12.000.

O'Connor, Leo Patrick: *See—*
Flood, John Michael; Messervey, Clifford Harry; Dye, Richard; and O'Connor, Leo Patrick, 4,105,122, Cl. 209-73.000.

Oda, Takaaki; and Takeuchi, Kazuo, to Nissan Motor Company, Ltd. Instrument panel for a vehicle. 4,105,223, Cl. 280-752.000.

Odencrantz, Clyde. Washing device. 4,104,744, Cl. 4-159.000.

Odhner, Oliver R. Custodial eraser. 4,104,759, Cl. 15-176.000.

O'Donnell, John Francis. Safety flexure for articulated channel-shaped roadway posts. 4,105,350, Cl. 403-220.000.

Oertle, Donald H., to Continental Oil Company. Early crack detection with multi-pressure system. 4,104,906, Cl. 73-104.000.

Oeschger, Joseph E., to International Telephone and Telegraph Corporation. Vacuum relay with reduced sensitivity to manufacturing tolerances and optional latching feature. 4,105,982, Cl. 335-151.000.

O'Farrell, Charles P.; and Kresge, Edward N., to Exxon Research & Engineering Co. Process for sulfonating polymers. 4,105,647, Cl. 526-33.000.

Ogasawara, Takeshi: *See—*
Miyazaki, Tsutomu; Yoshizawa, Toshio; Yoshida, Yoshiaki; Mitsuya, Kinpei; and Ogasawara, Takeshi, 4,105,165, Cl. 242-18.0PW.

Ogata, Yasuhiro; and Hibino, Noburo, to Fuji Photo Film Co., Ltd. Pressure measuring method. 4,104,910, Cl. 73-141.00R.

Ogawa, Shinsaku; and Yoshida, Muneo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for electrolysis of alkali halide. 4,105,515, Cl. 204-98.000.

Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, to Seiko Koki Kabushiki Kaisha. Reversal preventing device of electric clock. 4,104,859, Cl. 58-23.00D.

Ogura Jewel Industry Co., Ltd.: *See—*
Ogura, Junshiro, 4,105,212, Cl. 274-38.000.

Ogura, Junshiro, to Ogura Jewel Industry Co., Ltd. Reproducing stylus for phonograph records. 4,105,212, Cl. 274-38.000.

Oguro, Takeshi: *See—*
Fujishiro, Takeshi; Wazawa, Kiyoshi; and Oguro, Takeshi, 4,105,524, Cl. 204-195.00S.

Oguro, Yoshiharu, to Nalco-Hakuto Chemical Company. Composition for the control of corrosion and foaming in the acrylonitrile plants. 4,105,582, Cl. 252-392.000.

Ohara, Katsunobu: *See—*
Shinohara, Yukimasa; Ohara, Katsunobu; and Ando, Yujiro, 4,105,444, Cl. 96-1.00R.

Ohi, Reiichi: *See—*
Shiba, Keisuke; Aono, Toshiaki; Kubodera, Seiiti; Hirose, Takeshi; Ohi, Reiichi; and Shishido, Tadao, 4,105,452, Cl. 96-74.000.

Ohio Agricultural Research and Development Center: *See—*
Peng, Andrew C., 4,105,803, Cl. 426-583.000.

Ohlschlager, Hans: *See—*
Hoffmann, Klaus; Meyer, Rudolf; and Ohlschlager, Hans, 4,106,027, Cl. 346-1.000.

Ohmori, Hisashi: *See—*
Ohnishi, Masayuki; Ohmori, Hisashi; and Yamamoto, Yoshiji, 4,105,059, Cl. 164-4.000.

Ohnishi, Masayuki; Ohmori, Hisashi; and Yamamoto, Yoshiji, to Kawa-

saki Seitetsu K.K. Method of reducing the casting width during continuous casting. 4,105,059, Cl. 164-4.000.

Ohno, Toshiaki; and Niizeki, Kiyoshi, to Hoya Lens Corporation. Process for demisting transparent materials. 4,105,809, Cl. 427-164.000.

Ohorodnik, Alexander: *See—*
Auer, Eberhard; Ohorodnik, Alexander; and Stutzke, Paul, 4,105,689, Cl. 260-502.500.

Oishi, Atsushi: *See—*
Matsuoka, Yoshifumi; Matsumura, Takemasa; Shigematsu, Koichi; and Oishi, Atsushi, 4,105,020, Cl. 128-2.05A.

Okabe, Katsuhiko, to Copal Company Limited. Line printer. 4,104,967, Cl. 101-99.000.

Okada, Fumio, to Director of National Research Institute of Tea. Plant viral disease inhibitor. 4,105,784, Cl. 424-283.000.

Okada, Kunihiro; Itatsuda, Yoshiharu; Endoh, Takeyuki; Yabuuchi, Shigeru; and Yokozawa, Norio, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Digital differential analyzer. 4,106,100, Cl. 364-702.000.

Okuda, Masahiro: *See—*
Sakai, Shoji; and Okuda, Masahiro, 4,105,716, Cl. 260-884.000.

Okuno, Youichi: *See—*
Kawakita, Yukimasa; and Okuno, Youichi, 4,106,038, Cl. 354-155.000.

Okuyama, Yasuo: *See—*
Suzuki, Gyoichi; Miura, Mitsutoshi; Miyazu, Takashi; Matsushita, Taro; and Okuyama, Yasuo, 4,105,501, Cl. 201-6.000.

Oldham, Guy Franklin, to British Petroleum Company Limited, The. Oil-containing effluent treatment by gravity separation. 4,105,553, Cl. 210-73.00W.

Olin Corporation: *See—*
Justice, David D.; Ahn, Byung K.; and Dotson, Ronald L., 4,105,514, Cl. 204-98.000.
Kuo, Han C.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 4,105,531, Cl. 204-290.00R.
Patel, Harshad M., 4,105,441, Cl. 75-81.000.
Raes, Maurice C.; and Adams, Pierrepont, 4,105,686, Cl. 260-453.0PH.
Wojtowicz, John A., 4,105,565, Cl. 252-1.000.

Olshansky, Robert, to Corning Glass Works. Buffered optical waveguide fiber. 4,105,284, Cl. 350-96.330.

Olsztyn, Joseph T.: *See—*
Rossol, Lothar; Olsztyn, Joseph T.; Dewar, Robert; and Holland, Steven W., 4,105,925, Cl. 250-561.000.

Olympia Werke AG: *See—*
Fortmann, Hermann, 4,104,963, Cl. 100-176.000.

Olympus Optical Company Limited: *See—*
Inoue, Yasuo, 4,106,078, Cl. 362-32.000.

O'Mahony, John P.: *See—*
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,105,799, Cl. 426-44.000.

Omura, Yoshiaki: *See—*
Fujita, Yoshiji; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,105,700, Cl. 568-875.000.

Ondetti, Miguel Angel; and Cushman, David W., to E. R. Squibb & Sons, Inc. Proline derivatives and related compounds. 4,105,776, Cl. 424-274.000.

Ondetti, Miguel Angel; and Cushman, David W., to E. R. Squibb & Sons, Inc. Carboxyalkylacylamino acids. 4,105,789, Cl. 424-309.000.

Ono, Eishiro: *See—*
Yaguchi, Hiroyasu; and Ono, Eishiro, 4,104,904, Cl. 72-445.000.

Ono, Katsutoshi; and Sekiguchi, Koichi, to Nissan Motor Company, Ltd. Indicator using changeable path through transparent material. 4,104,981, Cl. 116-124.00L.

Ono, Kozo; and Kato, Taketoshi, to Hitachi Construction Machinery Co., Ltd. Radial piston type multi-stroke hydraulic pump or motor. 4,104,956, Cl. 91-491.000.

Ono, Yoshitami: *See—*
Numata, Yasumasa; Ito, Kunio; Mori, Keiichi; and Ono, Yoshitami, 4,105,453, Cl. 96-114.500.

Ontario Energy Corporation: *See—*
McQuitty, Stanley, 4,105,537, Cl. 208-11.0LE.

Ooimi, Tatuo: *See—*
Suzuki, Masayoshi; Ooimi, Tatuo; Yabe, Toshinori; and Takahashi, Shoji, 4,105,487, Cl. 156-405.00R.

Oppolzer, Wolfgang, to CHON Corporation. Trans-N-acyl-N-alkyl-1-amino-1,3-butadienes, trans-N-acyl-N-aryl-1-amino-1,3-butadienes and preparation thereof. 4,105,853, Cl. 560-24.000.

Opron, Robert; Bourguignon, Philippe; and Guelton, Claude, to Regie Nationale des Usines Renault. Pivoting and sliding window. 4,104,827, Cl. 49-385.000.

Orenstein, Henry, to Consumer Concepts, Inc. Hand operated instruments having non-magnetic safety switch. 4,105,885, Cl. 200-52.00R.

Orion Research Incorporated: *See—*
Synnott, John C.; and Ross, James W., Jr., 4,105,525, Cl. 204-195.00P.

Orth, George Otto, Jr., to Norfin, Inc. Adhesive composition and binding method. 4,105,611, Cl. 260-27.0EV.

Osswald, Gunter; and Graf, Hans, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of pigment-synthetic resin concentrates. 4,105,464, Cl. 106-307.000.

Oster, Doran M. Capo. 4,104,947, Cl. 84-318.000.

Otani, Hiroaki, to Nippon Prosensor Co., Ltd. Signal treatment circuit for burglar alarms. 4,106,003, Cl. 340-530.000.

Otsuka, Hirotaka: *See—*
Miyagawa, Katsuhiko; Kunishige, Hidenori; Otsuka, Hirotaka; and Nakao, Fusafumi, 4,105,918, Cl. 250-337.000.

Ottertun, Harald Daniel: *See—*
Reinhardt, Hans; Ottertun, Harald Daniel; and Andersson, Sven Otto Sigbert, 4,105,743, Cl. 423-24.000.

Ours, Carroll Wayne: *See—*
Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, 4,105,787, Cl. 424-309.000.
Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, 4,105,788, Cl. 424-309.000.

Overmyer, Richard C.; and Guerra, Mario, to Francesville Drain Tile Corporation. Apparatus for applying filter to a drainage tubing. 4,104,774, Cl. 29-234.000.

Owaki, Isao; Nakamura, Shinji; and Tsuchikane, Yoshiyuki, to Victor Company of Japan, Ltd. Device for cutting a sound groove on a disc recording medium. 4,105,213, Cl. 274-38.000.

Owatonna Tool Company: *See—*
McClocklin, Samuel B., 4,105,369, Cl. 417-206.000.

Owen, R. Calvin, Jr.; and Plummer, William T., to Polaroid Corporation. Aspheric plastic triplet. 4,105,308, Cl. 350-189.000.

Owens-Corning Fiberglas Corporation: *See—*
Foley, Kevin M.; Rastogi, Anil K.; and Rynd, Joseph P., 4,105,492, Cl. 156-629.000.
Shannon, Richard F.; and Denton, Douglas L., 4,105,623, Cl. 260-38.000.

Owens-Illinois, Inc.: *See—*
Boling, Norman L., 4,105,956, Cl. 331-94.50Q.
Kupsky, George A., 4,105,889, Cl. 219-121.0LM.

Owsley, Herbert B.: *See—*
Bunn, Stuart E.; and Owsley, Herbert B., 4,105,058, Cl. 151-41.740.

Oxon Italia S.p.A.: *See—*
Motta, Raimondo, 4,105,703, Cl. 260-665.00G.

Oyama, Yoshishige: *See—*
Hohsho, Yukio; Karino, Kimiji; Momono, Masakichi; Oyama, Yoshishige; Yamauchi, Teruo; and Teranishi, Takao, 4,105,720, Cl. 261-34.00A.

P. Ferrero & C. S.p.A.: *See—*
Dogliotti, Amilcare, 4,105,801, Cl. 426-99.000.

P. R. Mallory & Co. Inc.: *See—*
Klein, Gerhart P., 4,104,985, Cl. 118-211.000.

Paccar Inc.: *See—*
Simons, Wayne K.; and Teodoro, Donald J., 4,105,245, Cl. 280-65.00R.

Pacific Scientific Company: *See—*
Klimaitis, Martin K., 4,105,098, Cl. 188-1.00B.

Pacific Western Systems: *See—*
Worsham, Daniel A., 4,104,867, Cl. 58-90.00R.

Pacific, William L., to Rogers Foam Corporation. Impact protection pad. 4,105,220, Cl. 280-289.00E.

Pacitti, William. Sofa bed with TV headrest. 4,104,745, Cl. 5-13.000.

Padgitt, Kenneth Warren, to Motorola, Inc. Multiple slope ignition spark timing circuit. 4,104,997, Cl. 123-117.00R.

Padovani, Pietro, to O.M.V. S.p.A. System for the production of finished hollow objects, formed from a strip of plastics material by heat moulding. 4,105,736, Cl. 264-153.000.

Pagen, Charles Anthony: *See—*
Cushman, Donald Royal; Pagen, Charles Anthony; Schick, John William; and Yan, Tsoung-Yuan, 4,105,612, Cl. 260-27.0EV.

Pai, Karnire S., to Huyck Corporation. Stretch-resistant papermakers belts having non-porous synthetic cables. 4,105,495, Cl. 162-348.000.

Palmaer, Tore Georg. Kitchen cupboard assemblies. 4,105,269, Cl. 312-248.000.

Panafacom Limited: *See—*
Nitta, Atsushi; and Haida, Hirotoshi, 4,106,104, Cl. 364-900.000.

Paoli, Thomas Lee, to Bell Telephone Laboratories, Incorporated. Derivative measurement by frequency mixing. 4,106,096, Cl. 364-481.000.

Parekh, Girish Girdhar, to American Cyanamid Company. Dimethoxymethyl diethoxymethyl glycoluril and coating compositions containing the same as a cross-linking agent. 4,105,708, Cl. 260-849.000.

Parel Societe Anonyme: *See—*
Haines, Kendrick Peter; and MacPherson, Roy Duncan, 4,105,532, Cl. 204-301.000.

Parise, James Louis; Schneider, Carl Michael; and Farrell, John Francis, to Siemens Aktiengesellschaft. Electronic telephone system including interexchange trunk repeaters for traffic with other systems. 4,105,872, Cl. 179-18.0AD.

Parke, Davis & Company: *See—*
De Wald, Horace A., 4,105,851, Cl. 548-324.000.

Parker, Peter R.; and Allen, Norman G., to Volstatic of Canada Limited. Powder conveying apparatus. 4,105,256, Cl. 302-51.000.

Parkins, William E.: *See—*
Darnell, Alfred J.; and Parkins, William E., 4,105,755, Cl. 423-648.00R.

Parks, John Allen. Steam heated hot air furnace having an electric steam boiler. 4,105,894, Cl. 219-365.000.

Parl, Steen Allan: *See—*
Pierce, John Norman; and Parl, Steen Allan, 4,105,958, Cl. 333-29.000.

Parodi, Antonio: *See—*
Vargiu, Silvio; Manzoni, Pier Luigi; Bernasconi, Mario; and Parodi, Antonio, 4,105,604, Cl. 260-17.200.

Parrish, David Richard; and Hajos, Zoltan George, to Hoffmann-La Roche Inc. Asymmetric synthesis of organic compounds. 4,105,696, Cl. 260-586.00F.

Parshin, Dmitry Nikolaevich: *See*—
Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.

Partyka, Richard Anthony; Standridge, Robert Ted; Howell, Henry George; and Shulgin, Alexander Theodore, to Bristol-Myers Company. 2-Amino-1-(2,5-dimethoxyphenyl)-butanes. 4,105,695, Cl. 260-570.80R.

Passavant-Werke Michelbacher Hutte: *See*—
Busse, Oswald; and Klesper, Hugo, 4,105,559, Cl. 210-225.000.

Passmore, Thomas Rivers: *See*—
Pritchard, Eric Harry; and Passmore, Thomas Rivers, 4,105,931, Cl. 315-278.000.

Patel, Harshad M., to Olin Corporation. Composition for the decomposition of sodium-mercury amalgam. 4,105,441, Cl. 75-81.000.

Paton, W. Donald: *See*—
Steenson, Thomas W.; and Paton, W. Donald, 4,105,240, Cl. 294-81.00R.

Patton, Tad L., to Exxon Research & Engineering Co. Heterocyclic polymer solutions and products therefrom. 4,105,616, Cl. 521-62.000.

Patzke, Hans-Jurgen: *See*—
Koerner, Gotz; and Patzke, Hans-Jurgen, 4,105,567, Cl. 252-8.600.

Paudler, William W.; Moser, Robert E.; and Pollack, Norman M., to Diamond Shamrock Corporation. Herbicidal 5,5'-bis-1,2,4-triazinyls. 4,105,434, Cl. 71-93.000.

Paul, Gerhard: *See*—
Himmele, Walter; Hupfer, Leopold; Toussaint, Herbert; and Paul, Gerhard, 4,105,669, Cl. 260-307.00F.

Pauls, James D.: *See*—
Capra, Nicholas G., 4,105,145, Cl. 222-340.000.

Paust, Joachim: *See*—
Schulz, Bernhard; Paust, Joachim; and Schneider, Joachim, 4,105,855, Cl. 560-190.000.

Payden, Floyd. Automatic gain control. 4,105,976, Cl. 325-404.000.

Payn, Christian Jacques Maurice Charles Alexis: *See*—
Guitton, Jacques; and Payn, Christian Jacques Maurice Charles Alexis, 4,105,835, Cl. 429-133.000.

Payton, Raymond Anthony, to Helix International Limited. Drawing instrument. 4,104,801, Cl. 33-27.00B.

Pease, Leroy I., to Tolo, Incorporated. Multi-port valve. 4,105,555, Cl. 210-136.000.

Peck, David B., to Dielectric Systems International, Inc. Electrostatic device. 4,105,294, Cl. 350-269.000.

Pederzini, Renzo: *See*—
Cislaghi, Ezio; Scotti, Alessandro; and Pederzini, Renzo, 4,106,108, Cl. 365-222.000.

Peng, Andrew C., to Ohio Agricultural Research and Development Center. Soybean-cheese whey food product. 4,105,803, Cl. 426-583.000.

Peng, Geoffrey: *See*—
Driscoll, John S.; Marquez, Victor E.; and Peng, Geoffrey, 4,105,774, Cl. 424-273.00R.

Pennewiss, Horst; Plainer, Hermann; Quis, Peter; Trabitzsch, Hans; Masanek, Juergen; and Jakob, Juergen, to Rohm GmbH. Polymerization method using ultraviolet light. 4,105,519, Cl. 204-159.230.

Pennzoil Company: *See*—
Drechsel, Erhart Karl; and Sardisco, John B., 4,105,748, Cl. 423-320.000.

Perettie, Donald J.: *See*—
Mullin, Charles R.; and Perettie, Donald J., 4,105,702, Cl. 260-658.00R.

Perraud, Raymond Jean, to Societe d'Etude et de Construction de Machines pour Toutes Industries S.E.C.O.M.A.S.A. Rock-drilling and bolt-setting apparatus. 4,105,081, Cl. 175-122.000.

Perreault, Donald A., to Xerox Corporation. Derivation of discrete Fourier transform components of a time dependent signal. 4,106,103, Cl. 364-827.000.

Perriman, Victor Herbert: *See*—
Neale, David John; and Perriman, Victor Herbert, 4,105,225, Cl. 282-27.500.

Perry, James L. Mowing machine. 4,104,851, Cl. 56-10.400.

Personal Products Company: *See*—
Chatterjee, Pronoy Kumar; and Morbey, Graham Kenneth, 4,105,033, Cl. 128-285.000.

Persson, Anders: *See*—
VonKrusenstierna, Otto; Persson, Anders; and Widell, Marja, 4,105,507, Cl. 204-1.00T.

Peska, Jan: *See*—
Benes, Milan; and Peska, Jan, 4,105,858, Cl. 560-222.000.

Petera, Theodor: *See*—
Herb, Eugen; Petera, Theodor; and Bitzel, Hubert, 4,104,940, Cl. 83-71.000.

Peters, Alan W., to Mobil Oil Corporation. Conversion of coal-derived liquids with a crystalline aluminosilicate zeolite catalyst. 4,105,535, Cl. 208-8.000.

Peters, Bernardus Gradus. Electrostatic loudspeaker having elastic diaphragm spacer elements cured in situ. 4,105,877, Cl. 179-111.00R.

Petersen, Egon Norbert, to Dynamit Nobel Aktiengesellschaft. Halogen-containing aromatic ether-ester fire-retardants for plastics. 4,105,628, Cl. 260-45.85R.

Petersen, Gary L.; and Liedtke, Larry L., to United States of America, Navy. Electronic ignition system for liquid explosive. 4,104,970, Cl. 102-220.000.

Petersen, Jorgen, to KemaNobel AB. Production of expandable beads from the thermoplastic materials. 4,105,596, Cl. 521-56.000.

Peterson, James O.: *See*—
Sweeney, Richard F.; Peterson, James O.; Sukornick, Bernard; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,105,691, Cl. 260-530.00R.

Peterson, Richard H. Voicing system for electronic organ. 4,104,946, Cl. 84-1.240.

Petito, Ferdinand C.: *See*—
Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,104,771, Cl. 29-25.140.

Petroff, Robert J. Machine tool having quill control means. 4,105,361, Cl. 408-130.000.

Petros, Andrew J., to Mesta Machine Company. Tension reel for strip coiling. 4,105,172, Cl. 242-78.100.

Pettersson, Bengt Edvard, to Sunds Aktiebolag. Process of gas-phase bleaching high consistency finely disintegrated pulp. 4,105,494, Cl. 162-19.000.

Petzinger, Manfred W. A. Portable compost container. 4,105,412, Cl. 23-259.100.

Peynaud, Francois: *See*—
Clavelloux, Noel; Peynaud, Francois; and Posseme, Gilles, 4,104,912, Cl. 73-189.000.

Pfitzenmaier, Raymond W.: *See*—
Bard, Charles L.; and Pfitzenmaier, Raymond W., 4,104,953, Cl. 89-14.00E.

Pfizer Inc.: *See*—
Hynes, John L., Jr., 4,105,923, Cl. 250-456.000.
Nakanishi, Susumu, 4,105,668, Cl. 260-306.70R.

Pfleiderer, Ernst: *See*—
Monsheimer, Rolf; and Pfleiderer, Ernst, 4,105,402, Cl. 8-94.170.

Philipp, Adolph H.; and Jirkovsky, Ivo L., to Ayerst, McKenna & Harrison, Ltd. Fused γ-pyrone-2-carboxylic acid derivatives and process therefor. 4,105,778, Cl. 424-275.000.

Phillips, Bernard C., to Borg-Warner Corporation. Charge forming method and apparatus with accelerating system. 4,104,994, Cl. 123-73.00R.

Phillips Petroleum Company: *See*—
Little, Donald M.; and Hann, Paul D., 4,105,707, Cl. 260-683.480.
McDaniel, Max Paul, 4,105,844, Cl. 526-106.000.
Naylor, Floyd E., 4,105,845, Cl. 526-117.000.
Newton, Richard C.; and Romanek, Gerald A., 4,105,484, Cl. 156-380.000.
Platt, Louis; Wishman, Marvin; Gentry, David R.; and Williams, Jake E., 4,105,381, Cl. 425-83.100.
Trepka, William J.; and Rothlisberger, Alvin C., 4,105,714, Cl. 260-879.000.

Phillips, William. Electronic ignition. 4,105,005, Cl. 123-148.00E.

Piber, Earl T.: *See*—
Hastings, Jerome K.; and Piber, Earl T., 4,105,883, Cl. 200-296.000.

Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, to English Electric Valve Company Limited. Multipactor discharge arrangements. 4,105,951, Cl. 331-90.000.

Pierburg GmbH & Co KG: *See*—
Hartel, Gunter, 4,105,001, Cl. 123-140.0CC.

Pierce, John Norman; and Parl, Steen Allan, to Signatron, Inc. Large delay spread channel simulator. 4,105,958, Cl. 333-29.000.

Pierdet, Andre; and Azadian, Genevieve, to Roussel Uclaf. Anabolisant-androgenic compounds. 4,105,761, Cl. 424-243.000.

Piesinger, Gregory H.: *See*—
Fitting, Robert C.; and Piesinger, Gregory H., 4,105,977, Cl. 325-472.000.

Pietsch, Wolfgang B.; and Schroer, Charles A., to Midrex Corporation. Briquet and method of making same. 4,105,457, Cl. 106-78.000.

Pilia, Frank J.: *See*—
Hill, Clifford W.; Carkhuff, Donald W.; and Pilia, Frank J., 4,105,891, Cl. 219-137.430.

Pilla, Arthur A.: *See*—
Ryaby, John P.; and Pilla, Arthur A., 4,105,017, Cl. 128-1.500.

Pingeton, Charles, to Doring Labels, Inc. Multi-function label and carrier web. 4,104,816, Cl. 40-2.00R.

Pinkstaff, Carlos Dean, to Babcock & Wilcox Company, The. Pneumatic buffering system. 4,104,899, Cl. 72-24.000.

Pirelli General Cable Works Ltd.: *See*—
Ball, Edmund Hugh, 4,105,860, Cl. 174-15.00C.

Pizzini, Louis C.: *See*—
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,105,597, Cl. 521-159.000.

Placek, Ronald J.: *See*—
Timo, Dominic P.; Placek, Ronald J.; Gonyea, David C.; Johnson, Lloyd H.; and Kure-Jensen, Jens, 4,104,908, Cl. 73-117.300.

Plainer, Hermann: *See*—
Pennewiss, Horst; Plainer, Hermann; Quis, Peter; Trabitzsch, Hans; Masanek, Juergen; and Jakob, Juergen, 4,105,519, Cl. 204-159.230.

Plank, Charles J.; Rubin, Mae K.; and Rosinski, Edward J., to Mobil Oil Corporation. Hydrocarbon conversion over ZSM-38. 4,105,541, Cl. 208-111.000.

Plasse, Paul A., to Polaroid Corporation. Vented flat battery. 4,105,831, Cl. 429-86.000.

Plastic Enterprises Pty. Limited: *See*—
Atkin, Howard Dawson; Stachurski, Zbigniew Henryk; and Cherry, Brian Wilson, 4,105,117, Cl. 206-501.000.

Plastofilm Industries, Inc.: *See*—
Mascetti, Joseph A., 4,105,121, Cl. 206-592.000.

Platt, Louis; Wishman, Marvin; Gentry, David R.; and Williams, Jake E., to Phillips Petroleum Company. Apparatus for the production of a nonwoven fabric. 4,105,381, Cl. 425-83.100.

Plattner, Werner, administrator: *See*—
Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased; Thiel, Max; and Vomel, Wolfgang, 4,105,772, Cl. 424-269.000.

Platzer, Roger: *See*—
Arod, Jean; Gauthier, Michele; and Platzer, Roger, 4,105,508, Cl. 204-1.00T.

Plessey Handel und Investments AG: *See*—
Spence, Gordon; Hemmens, Cecil Godfrey; and Godfrey, Alan, 4,105,987, Cl. 338-130.000.

Plourde, Aime. Liquid decanting and recycling machine. 4,105,342, Cl. 401-15.000.

Plummer, Dexter Robert; and Jones, Roderick Frank, to Strathearn Audio Limited. Phonograph pick-up arm control arrangement. 4,105,961, Cl. 318-676.000.

Plummer, William T., to Polaroid Corporation. Defocused unicell photometer with aspheric zone. 4,105,300, Cl. 356-225.000.

Plummer, William T.: *See*—
Owen, R. Calvin, Jr.; and Plummer, William T., 4,105,308, Cl. 350-189.000.

Plumtree, William Ernest George: *See*—
Wilson, Lional Agustin; Wales, John; and Plumtree, William Ernest George, 4,105,445, Cl. 96-1.50R.

Plunkett, James P., to Coils, Inc. Lead attachment means and method for making electrical coils. 4,105,985, Cl. 336-90.000.

Pohlig-Heckelbleichert Vereinigte Maschinenfabriken Aktiengesellschaft: *See*—
Blinn, Ludwig, 4,105,143, Cl. 222-161.000.

Pohto, Gerald R., to Diamond Shamrock Corporation. Helical intercell connector for electrolytic cells. 4,105,529, Cl. 204-267.000.

Polaroid Corporation: *See*—
Buckler, Sheldon A., 4,105,815, Cl. 429-152.000.
Czumak, Frank M.; and Stella, Joseph A., 4,106,042, Cl. 354-317.000.
Holmes, William A.; and Scholz, Donald T., 4,105,307, Cl. 352-72.000.
Mehta, Avinash C.; Rickter, Donald O.; and Taylor, Lloyd D., 4,105,694, Cl. 260-561.00H.
Mills, Loring K., 4,106,034, Cl. 354-31.000.
Owen, R. Calvin, Jr.; and Plummer, William T., 4,105,308, Cl. 350-189.000.
Plasse, Paul A., 4,105,831, Cl. 429-86.000.
Plummer, William T., 4,105,300, Cl. 356-225.000.
Scholz, Donald T., 4,105,309, Cl. 352-130.000.

Polhuis, Antonius. Indoor football (soccer) match set. 4,105,208, Cl. 273-95.00R.

Pollack, Norman M.: *See*—
Paudler, William W.; Moser, Robert E.; and Pollack, Norman M., 4,105,434, Cl. 71-93.000.

Pollard, John Kingsley, Jr.: *See*—
Drell, William; and Pollard, John Kingsley, Jr., 4,105,794, Cl. 424-317.000.

Pollmeier, Konrad; and Hannemann, Franz, to Durkoppwerke GmbH. Fabric-feed control for sewing machine. 4,104,977, Cl. 112-121.260.

Polton, Alain: *See*—
Sigwalt, Pierre; Polton, Alain; Baudin, Cecile; and Miskovic, Mihajlo (Michel), 4,105,713, Cl. 260-879.000.

PolyGulf Associates: *See*—
Horowitz, Carl; Dichter, Michael; and Mangaraj, Duryodhan, 4,105,811, Cl. 427-302.000.

Polysius AG: *See*—
Ritzmann, Horst, 4,105,396, Cl. 432-14.000.

Polytechnic Institute of New York: *See*—
Sforza, Pasquale M., 4,105,362, Cl. 415-2.000.

Pond, Charles Ray. Electro-optical device for use in improved interferometers. 4,105,336, Cl. 356-113.000.

Portinari, Antonio; and Lavezzari, Piero, to Industrie Pirelli Societa per Azioni. Apparatus for impregnating stranded wires during stranding thereof. 4,105,485, Cl. 156-382.000.

Posseme, Gilles: *See*—
Clavelloux, Noel; Peynaud, Francois; and Posseme, Gilles, 4,104,912, Cl. 73-189.000.

Possum Controls Limited: *See*—
Harrison, Leslie Herbert Raymond, 4,106,101, Cl. 364-709.000.

Pothmann, Reinhold: *See*—
Haake, Manfred; Pothmann, Reinhold; Ahrens, Kurt H.; and Fritschi, Edgar, 4,105,795, Cl. 424-320.000.

Pott, Heinz-Hermann. Apparatus for folding collapsible box blanks. 4,105,197, Cl. 270-68.00R.

Potter, Dennis J.: *See*—
Horn, John H.; Morehead, William R.; Hurst, Ronald C.; Potter, Dennis J.; and Schaub, Clyde D., 4,105,750, Cl. 423-456.000.

Poulin, Laurent: *See*—
L'Ecuyer, Camille; and Poulin, Laurent, 4,105,201, Cl. 272-111.000.

PPG Industries, Inc.: *See*—
Bonaddio, Robert M., 4,104,939, Cl. 83-7.000.
Martinsons, Aleksandrs; and Johnson, Harlan B., 4,105,516, Cl. 204-98.000.

Prameta Prazisonsmetallund Kunststofferzeugnisse G. Baumann & Co.: *See*—
Schneider, Eberhard; and Vitt, Theodor, 4,105,359, Cl. 408-112.000.

Precision International, Inc.: *See*—
Hohne, Walter; and Hines, Robin H., 4,105,332, Cl. 356-5.000.

Presby, Herman Melvin: *See*—
Gloge, Detlef Christoph; Kaminow, Ivan Paul; and Presby, Herman Melvin, 4,105,283, Cl. 350-96.310.

Pressley, Joseph R.: *See*—
Wasson, Joe R.; Pressley, Joseph R.; Baker, Robert W.; Fairaizl, Joseph H.; and Zorker, Richard J., 4,105,328, Cl. 355-78.000.

Preston, John: *See*—
Hughes, Clifford Ronald; Jackson, Stephen John; Preston, John; and Walton, Peter Leslie, 4,105,790, Cl. 424-309.000.

Preus, Paul. Inflatable barrier. 4,104,884, Cl. 61-1.00F.

Pritchard, Eric Harry; and Passmore, Thomas Rivers, to Thorn Electrical Industries Limited. Inductor structures for electrical discharge lamp circuits. 4,105,931, Cl. 315-278.000.

Process Engineering, Inc.: *See*—
Schultz, Jeffrey A.; and Eifel, Paul J., 4,104,783, Cl. 29-451.000.

Procter & Gamble Company, The: *See*—
Adrion, David Martin; and Hartsough, Lloyd Bruce, 4,105,038, Cl. 132-7.000.
Collins, Jerome H., 4,105,592, Cl. 252-545.000.
Jacobsen, Ronald Lowell, 4,105,573, Cl. 252-99.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Brouard, Claude Marie Henri Emile; Dupont, Bernard; Leroy, Jean-Marie Louis; and Stiot, Jean-Pierre Henri, 4,105,653, Cl. 260-158.000.

Proefrock, Paul R.: *See*—
Miller, James Clayton; and Proefrock, Paul R., 4,104,894, Cl. 70-52.000.

Prokupek, Jiri: *See*—
Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, 4,105,744, Cl. 423-239.000.

Propst, Richard Lee: *See*—
Megy, Joseph Allen; and Propst, Richard Lee, 4,105,469, Cl. 134-3.000.

Pross, John William, Jr., to Singer Company, The. Zero detector. 4,106,105, Cl. 364-900.000.

Prosser, Thomas John, to Hercules Incorporated. Conversion of stereoregular polypropylene to atactic polypropylene. 4,105,837, Cl. 526-26.000.

Pu, Lyong Sun, to Fuji Xerox Co., Ltd. Organic photoconductive coating compositions containing tricyanovinyl compounds for electrophotography. 4,105,446, Cl. 96-1.50R.

Pury, Thomas; Gray, Floyd L.; Sivertsen, Marvin L.; Konle, Robert L.; and Stehr, Richard E., to General Electric Company. X-ray spot film device. 4,105,920, Cl. 250-402.000.

Puschnerat, Helmut: *See*—
Schwaab, Manfred; Puschnerat, Helmut; Kluzik, Fritz; Junger, Manfred; Wilding, Ernst; and Tittes, Hans, deceased, 4,104,968, Cl. 101-415.100.

Pyatigorsky, Vladimir Mikhailovich: *See*—
Aizenberg, Julian Borisovich; Bukhman, Inokh Borukhovich; and Pyatigorsky, Vladimir Mikhailovich, 4,105,293, Cl. 350-264.000.

Pytlarz, Charles P.: *See*—
Kesic, Branimir; and Pytlarz, Charles P., 4,105,989, Cl. 338-180.000.

QMA Inc.: *See*—
Mendoza, Gregory E.; Henthorn, Donald Ray; and Taylor, James Franklin, 4,105,188, Cl. 254-10.500.

Quaker Oats Company, The: *See*—
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,105,799, Cl. 426-44.000.

Qualidyne Systems, Inc.: *See*—
Cathell, Frank, 4,105,957, Cl. 331-110.000.

Quinn, Bernard W., to McDonnell Douglas Corporation. Optical color communication system. 4,105,290, Cl. 350-168.000.

Quis, Peter: *See*—
Pennewiss, Horst; Plainer, Hermann; Quis, Peter; Trabitzsch, Hans; Masanek, Juergen; and Jakob, Juergen, 4,105,519, Cl. 204-159.230.

R B Toy Development Co.: *See*—
Kupperman, Sam; and Kupperman, Dennis I., 4,105,349, Cl. 403-209.000.

R. H. Sheppard Co., Inc.: *See*—
Keller, Dale L., 4,105,360, Cl. 408-118.000.

R. W. Hartnett Company: *See*—
Ackley, Charles E., Jr.; and Ackley, Charles E., Sr., 4,104,966, Cl. 101-40.000.

Raasch, Ernest M.: *See*—
Van Wagener, Raymond H.; Raasch, Ernest M.; and Loos, Elsio J., 4,105,196, Cl. 270-58.000.

Racciato, Joseph S., to Merck & Co., Inc. Thickening compositions containing xanthan gum, guar gum and starch. 4,105,461, Cl. 106-205.000.

Racciato, Joseph S.: *See*—
Cottrell, Ian W.; Empey, Richard A.; and Racciato, Joseph S., 4,105,605, Cl. 260-17.4GC.

Raden, David J.: *See*—
Wilson, Robert A.; and Raden, David J., 4,105,749, Cl. 423-320.000.

Radici, Pierino; Custro, Sergio; Ermoni, Mario; and Colombo, Paolo, to Societa' Italiana Resine S.I.R. S.p.A. Process for improving the stability of etherified acetal homopolymers. 4,105,638, Cl. 528-130.000.

Raduchel, Bernd: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,105,792, Cl. 424-313.000.

Raes, Maurice C.; and Adams, Pierrepont, to Olin Corporation. Process for deactivating toluene diisocyanate distillation residue. 4,105,686, Cl. 260-453.0PH.

Raether, Wolfgang: *See—*
Winkelmann, Erhardt; and Raether, Wolfgang, 4,105,763, Cl. 424-246.000.

Raffel, Marvin J. Massaging furniture. 4,105,024, Cl. 128-33.000.

Raffel, Reiner: *See—*
Althausen, Ferdinand; and Raffel, Reiner, 4,105,045, Cl. 137-563.000.

Rahaim, Sarah E. Convertible garment. 4,104,742, Cl. 2-213.000.

Rallis, Anthony T.: *See—*
Sorensen, Robert Keith; and Rallis, Anthony T., 4,105,263, Cl. 308-8.200.

Ramer, James LeRoy. Rail joint bar for non-uniform rails. 4,105,160, Cl. 238-167.000.

Ramsey, John B., Jr.: *See—*
Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,104,771, Cl. 29-25.140.

Ramsey, William S.: *See—*
Hertl, William; and Ramsey, William S., 4,105,498, Cl. 195-59.000.

Rand, Arthur G., Jr.: *See—*
Jahns, Frederick D.; and Rand, Arthur G., Jr., 4,105,800, Cl. 426-61.000.

Rand, Earl W., Jr. Fuel saving apparatus for multiple cylinder internal combustion engines. 4,105,010, Cl. 123-198.00F.

Rand, John Arthur: *See—*
Borst, Hans; Evans, Reginald David Owen; and Rand, John Arthur, 4,105,539, Cl. 208-33.000.

Randall, Bryce Ernest: *See—*
Howard, John Arthur; Randall, Bryce Ernest; and Fleming-Brown, David Hugh, 4,104,853, Cl. 56-341.000.

Rapp, Gunter; and Konrad, Marcel Celestin, to Licentia Patent-Verwaltungs-G.m.b.H. Arc blow-out switch. 4,105,880, Cl. 200-148.00A.

Raschke, Klaus; and Festinori, Volfango, to Siemens Aktiengesellschaft. Fixture for threading-on and simultaneously turning the nuts of several screw bolts. 4,104,934, Cl. 81-57.380.

Rasmussen, Hobert Manfred: *See—*
Nielsen, Verner; and Rasmussen, Hobert Manfred, 4,105,425, Cl. 65-14.000.

Rastogi, Anil K.: *See—*
Foley, Kevin M.; Rastogi, Anil K.; and Rynd, Joseph P., 4,105,492, Cl. 156-629.000.

Rathburn, Lloyd C., to Loomis International, Inc. Well packer including combination anti-extrusion and segment ring actuating washer. 4,105,215, Cl. 277-116.200.

Ravizza, Raymond Francis, to Ampex Corporation. Drive circuitry for controlling movable video head. 4,106,065, Cl. 360-109.000.

Raychem Corporation: *See—*
Glover, Leon C.; and Lopez, Eugene F., 4,105,583, Cl. 252-408.000.
Lofdahl, Clyde A., 4,105,481, Cl. 156-79.000.

Raymond, John L.: *See—*
Beatty, John C., III, 4,105,534, Cl. 204-301.000.

Raymond Lee Organization, Inc., The: *See—*
Burger, John P., 4,104,739, Cl. 2-155.000.
Carroll, Andrew C., 4,104,794, Cl. 30-268.000.
Elliott, Kenneth A., 4,105,179, Cl. 248-221.200.
Lake, Timothy R., 4,105,248, Cl. 296-84.00H.
Mobley, Robert L.; and Mobley, Della, 4,105,968, Cl. 324-133.000.
Van Vliet, Rutherford, Jr., 4,105,249, Cl. 297-230.000.

Raytheon Company: *See—*
Freedman, George; and Bowen, Robert F., 4,104,957, Cl. 99-283.000.

RCA Corporation: *See—*
Anderson, Wendell Goundrey, 4,105,944, Cl. 330-290.000.
Bloom, Allen; and Hung, Ling Kong, 4,105,654, Cl. 260-205.000.
Chapman, Herbert Hill, Jr., 4,106,060, Cl. 358-256.000.
Clay, Burton Ross; and Gore, Douglas Alan, 4,105,915, Cl. 250-199.000.
Crowley, Albert Timothy, 4,105,947, Cl. 331-1.00A.
Dingwall, Andrew Gordon Francis, 4,105,950, Cl. 331-57.000.
Geshner, Robert Andrew; and Mitchell, Joseph, Jr., 4,105,468, Cl. 134-3.000.
Goodman, Alvin Malcolm, 4,106,107, Cl. 365-191.000.
Henderson, John Goodchilde Norie; and Wine, Charles Martin, 4,106,059, Cl. 358-191.000.
Holbrook, Mark Denton; and Fillmore, Richard Plumb, 4,106,086, Cl. 363-60.000.
Johnson, Henry Charles, 4,106,020, Cl. 343-14.000.
Katagi, Kazuo, 4,106,021, Cl. 343-5.0SC.
Keizer, Eugene Orville, 4,104,832, Cl. 51-281.00R.
Khajezadeh, Heshmat, 4,106,048, Cl. 357-40.000.
Leidich, Arthur John, 4,105,901, Cl. 307-273.000.
Levine, Aaron William; Kaganowicz, Grzegorz; and Datta, Pabitra, 4,105,298, Cl. 350-340.000.
Maxemchuk, Nicholas Frank, 4,106,053, Cl. 358-13.000.
Reno, Charles William; and Herzog, Donald George, 4,105,926, Cl. 250-566.000.
Stachejko, Vitaly, 4,105,959, Cl. 333-31.00R.
Wolkstein, Herbert J., 4,105,948, Cl. 331-14.000.

Reath, Robert Z.: *See—*
Beatty, John C., III, 4,105,534, Cl. 204-301.000.

Recognition Equipment Incorporated: *See—*
Hampton, Perry Dwaine; and Tobey, Jimmie Lee, 4,106,030, Cl. 346-140.00R.

Reed, Ralph Clyde: *See—*
Smith, James George; and Reed, Ralph Clyde, 4,105,451, Cl. 96-66.00T.

Reed, Robert D.; Zink, John S.; and Schwartz, Robert E., to John Zink Company. Dual pressure flare. 4,105,394, Cl. 431-202.000.

Reed, Robert D.: *See—*
Goodnight, Hershel E.; Reed, Robert D.; and Witwer, Alan D., 4,105,395, Cl. 431-351.000.

Reed, Robert E.: *See—*
Haase, Donald A.; and Reed, Robert E., 4,105,491, Cl. 156-553.000.

Reedy, Wayne R.; and Eplett, Fredrick R., to Carrier Corporation. Defrost control for heat pumps. 4,104,888, Cl. 62-80.000.

Reese, Johannes: *See—*
Jung, Albert; Hultzsch, Kurt; Zimmermann, Rolf; and Reese, Johannes, 4,105,610, Cl. 260-27.0BB.

Regie Nationale des Usines Renault: *See—*
Leconte, Gilles, 4,105,928, Cl. 315-82.000.
Opron, Robert; Bourguignon, Philippe; and Guelton, Claude, 4,104,827, Cl. 49-385.000.

Reichl, Richard: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Reichl, Richard; and Giesemann, Rolf, 4,105,796, Cl. 424-330.000.
Kummer, Werner; Stahle, Helmut; Koppe, Herbert; Haarmann, Walter; and Reichl, Richard, 4,105,765, Cl. 424-248.560.

Reid, William Clinton: *See—*
Brownlee, Robert O., 4,104,844, Cl. 52-744.000.

Reiffert, Jurgen: *See—*
Wehle, Volker; and Reiffert, Jurgen, 4,105,405, Cl. 21-2.70R.

Reiney, Michael Goodwin: *See—*
Cleary, Edward Joseph, Jr.; and Reiney, Michael Goodwin, 4,105,932, Cl. 315-377.000.

Reinhardt, Hans; Ottertun, Harald Daniel; and Andersson, Sven Otto Sigbert, to Mx-Processer Reinhardt & Co. AB. Selectively extracting copper, zinc, nickel from a mixture of metal hydroxides. 4,105,743, Cl. 423-24.000.

Reinhardt, Paul W.: *See—*
Compton, Robert N.; Reinhardt, Paul W.; and Garrett, William R., 4,105,746, Cl. 423-251.000.

Rella, Agnus. Nasal prosthesis. 4,105,035, Cl. 128-342.000.

Rembaum, Alan: *See—*
Yen, Shiao-Ping S.; Rembaum, Alan; and Molday, Robert S., 4,105,598, Cl. 521-53.000.

Reno, Charles William; and Herzog, Donald George, to RCA Corporation. On-axis film scanner with reflected illumination. 4,105,926, Cl. 250-566.000.

Resler, Edwin L., Jr., to Cornell Research Foundation, Inc. Stratified charge. 4,104,989, Cl. 123-32.0ST.

Resler, Edwin L., Jr., to Cornell Research Foundation, Inc. Anti-pollution piston construction. 4,105,008, Cl. 123-191.00R.

Resler, Edwin L., Jr., to Cornell Research Foundation, Inc. Anti-pollution engine head construction. 4,105,009, Cl. 123-193.00H.

Rethmann, Werner: *See—*
Rowell, Douglas W.; and Rethmann, Werner, 4,104,903, Cl. 72-264.000.

Reusch, Robert J., to Continental Oil Company. Method of fluidized bed drying. 4,104,806, Cl. 34-10.000.

Revell, Peter Louis: *See—*
Debenham, Michael; Dalli, Allan George; and Revell, Peter Louis, 4,105,134, Cl. 220-268.000.

Rheinfrank, Lamson, Jr.; Bundy, Richard P.; and Clements, Jack T., to Standard Havens, Inc. Disposable filter cartridge. 4,105,421, Cl. 55-379.000.

Rheinmetall GmbH: *See—*
Moll, Manfred, 4,104,969, Cl. 102-49.300.

Rhone-Poulenc Industries: *See—*
Chabardes, Pierre, 4,105,697, Cl. 260-601.00R.

Richardson, Charles Raymond William: *See—*
Johnson, Morris Burton; and Richardson, Charles Raymond William, 4,105,281, Cl. 350-6.500.

Richardson, Norman: *See—*
Smith, Malcolm John; Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, 4,105,551, Cl. 210-58.000.

Richey, Vernon T. Releasable drill string stabilizer. 4,105,262, Cl. 308-4.00A.

Richter, Gerolf; and Shanks, Scott B., to Biotronik Mess- und Therapiegerate GmbH & Co. Releasable electrical connecting means for the electrode terminal of an implantable artificial cardiac pacemaker. 4,105,037, Cl. 128-419.00P.

Rickter, Donald O.: *See—*
Mehta, Avinash C.; Rickter, Donald O.; and Taylor, Lloyd D., 4,105,694, Cl. 260-561.00H.

Ricoh Company, Ltd.: *See—*
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Schuster, Wolfgang, to Herbert Kannegiesser Kommanditgesellschaft. Rotary device for producing and/or processing webs, pieces, foils and composite materials. 4,105,896, Cl. 219-470.000.
Schwaab, Manfred; Puschnerat, Helmut; Kluzik, Fritz; Junger, Manfred; Wilding, Ernst; and Tittes, Hans, deceased (by Tittes, Marga, Hans-Ulrich Tittes, Gerlach Stephan Tittes, Axel Michael Tittes, heirs), to Albert-Frankenthal AG. Clamping device for flexible printing plates. 4,104,968, Cl. 101-415.100.
Schwan, Thomas J.; and White, Ralph L., Jr., to Morton-Norwich Products, Inc. 1-Amino-3-(4-chlorophenyl)-2-imidazolidinone. 4,105,850, Cl. 548-319.000.
Schwartz, Robert E.: *See—*
Reed, Robert D.; Zink, John S.; and Schwartz, Robert E., 4,105,394, Cl. 431-202.000.
Schwerzel, Robert E.; Klosterman, Nancy E.; Kelly, John Robert; and Hillenbrand, Louis J., to Battelle Development Corporation. Catalytic extraction of stored solar energy from photochemicals. 4,105,014, Cl. 126-270.000.
Sciola, Joseph; and Nagy, Gabor, to Super Chuck, Inc. Safety drive chuck. 4,105,171, Cl. 242-68.400.
SCM Corporation: *See—*
McGinniss, Vincent D., 4,105,518, Cl. 204-159.140.
Scott, Donald K., Jr.; and McIntosh, Michael D., to Landis Tool Company. Battery charger. 4,105,962, Cl. 320-32.000.
Scotti, Alessandro: *See—*
Cislaghi, Ezio; Scotti, Alessandro; and Pederzini, Renzo, 4,106,108, Cl. 365-222.000.
Scovill Manufacturing Company: *See—*
Holdiman, Joe W., 4,105,352, Cl. 403-402.000.
Sebag, Henri; and Vanlerberghe, Guy, to L'Oreal. Polyglycerol nonionic surface active agents and process for preparing the same from crude glycidol. 4,105,580, Cl. 252-351.000.
Sebel, Harry; and Wood, Noel Sydney Davidson, to Sebel Limited. Desks. 4,105,271, Cl. 312-253.000.
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Sebel, Harry; and Wood, Noel Sydney Davidson, 4,105,271, Cl. 312-253.000.
Sebenda, Jan: *See—*
Bukac, Zbynek; Sebenda, Jan; and Loyda, Miloslav, 4,105,644, Cl. 528-314.000.
Seidel, Joachim: *See—*
Schultes, Tilmann; and Seidel, Joachim, 4,105,039, Cl. 135-25.00A.
Seidenberger, James W., to J. T. Baker Chemical Company. Spill control composition and use thereof. 4,105,576, Cl. 252-190.000.
Seifert, Edwin A., Jr. Universally supported implement frame section. 4,105,077, Cl. 172-311.000.
Seifert, Peter, to Black Clawson Company, The. Method for screening paper fiber stock. 4,105,543, Cl. 209-240.000.
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Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, 4,104,859, Cl. 58-23.00D.
Seil, Kenneth F., to Eastman Kodak Company. Electrophotographic apparatus having compensation for rest-run performance variations. 4,105,324, Cl. 355-14.000.
Seilly, Alec Harry, to Lucas Industries Limited. Electromagnetic actuators. 4,105,904, Cl. 310-27.000.
Seiter, William A.: *See—*
Levasseur, Joseph L.; and Seiter, William A., 4,105,867, Cl. 179-6.30R.
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Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, 4,104,859, Cl. 58-23.00D.
Sekiguchi, Koichi: *See—*
Ono, Katsutoshi; and Sekiguchi, Koichi, 4,104,981, Cl. 116-124.00L.
Sekiguchi, Tetsuo; Abe, Masami; Tsuruga, Kouji; and Tominaga, Nobuhide, to Argus Chemical Corporation. Mercaptoheterocyclic resin stabilizers. 4,105,627, Cl. 260-45.80N.
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Tanei, Tadayoshi; Nakamura, Shigeki; and Hotta, Masahiro, 4,105,449, Cl. 96-1.800.
Self, Richard E., to Control Components, Inc. High energy loss device. 4,105,048, Cl. 138-42.000.
Selleck, James R., Jr.: *See—*
Hunsucker, Jerry Hoyt; and Selleck, James R., Jr., 4,105,552, Cl. 210-64.000.
Semanchik, Michael; and Braunstein, David M., to Celanese Corporation. Process for producing a polyacetal polymer. 4,105,637, Cl. 528-241.000.
Semi-Alloys, Inc.: *See—*
Hascoe, Norman, 4,105,861, Cl. 174-52.0FP.
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Schierz, Winfried, 4,106,052, Cl. 357-72.000.
Senger, Hans-Jurgen, to Elna, GmbH. Radar viewing device. 4,105,912, Cl. 315-10.000.
Serini, Volker: *See—*
Hardt, Dietrich; Serini, Volker; Vernaleken, Hugo; and Braese, Hans-Eberhard, 4,105,711, Cl. 260-873.000.
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Grassy, Robert; Apert, Dominique; and Etchecopar, Arnaud, 4,105,993, Cl. 340-15.5CP.
Settineri, William J.; and Tolly, Milton C., to Dow Chemical Company, The. Treatment of interior surfaces of polymerization reactors to retard polymer buildup. 4,105,841, Cl. 526-62.000.
Sexsmith, David R., to Drew Chemical Corporation. Corrosion inhibitor. 4,105,581, Cl. 252-389.00A.
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Tachibana, Histaro; Fujii, Hisashi; and Sezaki, Tamotsu, 4,105,090, Cl. 181-265.000.
Sforza, Pasquale M., to Polytechnic Institute of New York. Double vortex augmentor wind conversion system. 4,105,362, Cl. 415-2.000.
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., to Ethicon, Inc. Poly(alkylene oxalate) absorbable coating for sutures. 4,105,034, Cl. 128-335.500.
Shanbrom, Edward; and Bishop, Robert C., to Edward Shanbrom, Inc. Method of preserving blood plasma I. 4,105,650, Cl. 260-112.00B.
Shanks, Scott B.: *See—*
Richter, Gerolf; and Shanks, Scott B., 4,105,037, Cl. 128-419.00P.
Shannon, Richard F.; and Denton, Douglas L., to Owens-Corning Fiberglas Corporation. Method of making molding compounds and materials made thereby. 4,105,623, Cl. 260-38.000.
Sharma, Kris: *See—*
Smeltzer, Paul; Sharma, Kris; Daneck, David A.; and McNally, Sellers B., 4,105,194, Cl. 267-64.00R.
Shaub, Harold; and Waddey, Walter E., to Exxon Research & Engineering Co. Lubricant composition. 4,105,571, Cl. 252-32.70E.
Shaw, Gustavus W.; and Walker, Raymond P., to American Home Products Corporation. Safety lid interlock circuit for centrifuges. 4,105,903, Cl. 307-328.000.
Shaw, Lamont; and Waire, Aaron O. Novelty hat device. 4,104,741, Cl. 2-185.00R.
Sheldon, John D.; and Textron Inc. Filament-type trimmer. 4,104,796, Cl. 30-276.000.
Sherwood, William Lyon. Continuous metal melting, withdrawal and discharge from rotary furnaces. 4,105,438, Cl. 75-49.000.
Shiba, Hiroshi; and Kani, Kenji, to Nippon Electric Co., Ltd. Large-scale semiconductor integrated circuit device. 4,104,785, Cl. 29-574.000.
Shiba, Keisuke; Aono, Toshiaki; Kubodera, Seiiti; Hirose, Takeshi; Ohi, Reiichi; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Multi-layered color photographic light-sensitive material. 4,105,452, Cl. 96-74.000.

Shibata, Toshihiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,105,625, Cl. 260-45.80N.
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Murata, Tomoji; Shibazaki, Kenji; Nakamura, Yoshihiro; and Kuse, Matsuo, 4,105,914, Cl. 235-92.0SB.
Shiga, Tsuyoshi: *See*—
Inoue, Motoichiro; Shiga, Tsuyoshi; and Kasahara, Nobuo, 4,105,322, Cl. 355-4.000.
Shigematsu, Koichi: *See*—
Matsuoka, Yoshifumi; Matsumura, Takemasa; Shigematsu, Koichi; and Oishi, Atsushi, 4,105,020, Cl. 128-2.05A.
Shimada, Junichi: *See*—
Kogure, Hiroshi; and Shimada, Junichi, 4,104,881, Cl. 60-299.000.
Shimizu, Akio, to Niles Parts Co., Ltd. Disconnection indicating apparatus for automobiles. 4,105,996, Cl. 340-73.000.
Shimizu, Katsuhiko: *See*—
Tuda, Goro; Shimizu, Katsuhiko; Murakami, Tudoi; and Nasu, Syouzi, 4,105,937, Cl. 318-568.000.
Shimizu, Kazuhiko, to Matsushita Electric Industrial Co., Ltd. Field effect type liquid crystal display device. 4,105,297, Cl. 350-336.000.
Shimizu, Toshihide: *See*—
Kitamura, Hajime; and Shimizu, Toshihide, 4,105,838, Cl. 526-62.000.
Koyanagi, Shunichi; Kitamura, Hajime; Shimizu, Toshihide; and Fushimi, Kenji, 4,105,839, Cl. 526-62.000.
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Iwai, Yuichiro; Shimoi, Akio; and Kawamura, Yoshikazu, 4,105,902, Cl. 307-308.000.
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Nakamoto, Soichi; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,106,033, Cl. 354-23.00D.
Shinohara, Yukimasa; Ohara, Katsunobu; and Ando, Yujiro, to Canon Kabushiki Kaisha. Air flow method of cleaning ion modulation photosensitive screen during corona charging. 4,105,444, Cl. 96-1.00R.
Shinozaki, Fumiaki; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Spectrally sensitized positive light-sensitive o-quinone diazide containing composition. 4,105,450, Cl. 96-33.000.
Shinozaki, Nobuo: *See*—
Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, 4,104,859, Cl. 58-23.00D.
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Shirai, Shinji: *See*—
Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; Umemoto, Sueo; and Suzuki, Kisaku, 4,105,511, Cl. 204-38.00A.
Shishido, Tadao: *See*—
Shiba, Keisuke; Aono, Toshiaki; Kubodera, Seiiti; Hirose, Takeshi; Ohi, Reiichi; and Shishido, Tadao, 4,105,452, Cl. 96-74.000.
Shiver, James William: *See*—
Moody, Asa Carlyle, Jr.; Kenward, Richard George; and Shiver, James William, 4,106,098, Cl. 364-500.000.
Showa Denko K.K.: *See*—
Nakamura, Junichi; Konuma, Hiroshi; Kokuryo, Shiro; Ueshima, Takashi; and Tsuge, Chutatsu, 4,105,608, Cl. 260-23.00R.
Showalter, William E., to Union Oil Company of California. Process for recovery of mineral values from underground formations. 4,105,253, Cl. 299-4.000.
Shulgin, Alexander Theodore: *See*—
Partyka, Richard Anthony; Standridge, Robert Ted; Howell, Henry George; and Shulgin, Alexander Theodore, 4,105,695, Cl. 260-570.80R.
Sidaway, Joseph Trevor. Hardness testing machine. 4,104,901, Cl. 73-81.000.
Siegel, Melvin W., to Extranuclear Laboratories, Inc. Methods and apparatus for simultaneously producing and electronically separating the chemical ionization mass spectrum and the electron impact ionization mass spectrum of the same sample material. 4,105,916, Cl. 250-282.000.
Siemens Aktiengesellschaft: *See*—
Borchert, Lothar; and Stenzel, Karl-Jorg, 4,105,828, Cl. 428-665.000.
Caspar, Heinz; Kudritzki, Felix; and Ziegler, Horst, 4,104,924, Cl. 73-716.000.
Caspar, Heinz; and Kudritzki, Felix, 4,104,925, Cl. 73-716.000.
Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, 4,105,871, Cl. 179-18.0AD.
Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, 4,105,874, Cl. 179-18.0AD.
Farrell, John Francis; and Treichel, Hans Herbert, 4,105,876, Cl. 179-18.0AD.
Geffcken, Walter; Krueger, Hans; and Walter, Karl-Heinz, 4,105,288, Cl. 350-350.000.
Hini, Paul; and Forster, Helmut, 4,105,012, Cl. 125-16.00R.
Krause, Gerhard, 4,105,943, Cl. 330-290.000.
Kuhnlein, Hans, 4,105,940, Cl. 318-653.000.
Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.
Parise, James Louis; Schneider, Carl Michael; and Farrell, John Francis, 4,105,872, Cl. 179-18.0AD.
Raschke, Klaus; and Festinori, Volfango, 4,104,934, Cl. 81-57.380.
Schimmel, Frederick William, 4,105,873, Cl. 179-18.0AD.
Schneider, Carl Michael; Schimmel, Frederick William; and Farrell, John Francis, 4,105,875, Cl. 179-18.0GF.
Trautner, Jurgen; and Kolbe, Peter, 4,106,069, Cl. 361-30.000.
Siesta Industries: *See*—
Grundler, Anthony F., 4,104,749, Cl. 5-76.000.
Sifferman, Thomas R.; and Sparlin, Derry D., to Continental Oil Company. Control of incompetent formations with thickened compositions containing base-settable resin. 4,105,618, Cl. 260-33.6UA.
Sigmund, Jerry A., to SPS Technologies, Inc. Tightening method and system. 4,104,779, Cl. 29-407.000.
Sigmund, Jerry A., to SPS Technologies, Inc. Method and system for tightening joint assembly. 4,104,780, Cl. 29-407.000.
Signatron, Inc.: *See*—
Pierce, John Norman; and Parl, Steen Allan, 4,105,958, Cl. 333-29.000.
Sigwalt, Pierre; Polton, Alain; Baudin, Cecile; and Miskovic, Mihajlo (Michel), to Agence Nationale de Valorisation de la Recherche (ANVAR). Polymers and copolymers of indene. 4,105,713, Cl. 260-879.000.
Silver Seiko Ltd.: *See*—
Kagaya, Yutaka, 4,105,157, Cl. 235-475.000.
Silverman, Arthur A. Power driven drain cleaner with safety overload clutch. 4,104,757, Cl. 15-104.3SN.
Simington, Jack F., to Simington Products Co. Saw chain sharpener. 4,104,793, Cl. 30-139.000.
Simington Products Co.: *See*—
Simington, Jack F., 4,104,793, Cl. 30-139.000.
Simons, John R.; and Fenske, John W., to Grunau Company Inc. Concealed sprinkler head. 4,105,076, Cl. 169-40.000.
Simons, Wayne K.; and Teodoro, Donald J., to Paccar Inc. Forward, stowable seat and back. 4,105,245, Cl. 280-65.00R.
Simpson Manufacturing Co., Inc.: *See*—
Gilb, Tyrell T., 4,104,843, Cl. 52-693.000.
Sindlinger, Ronald E.; and Audesse, Emery G., to GTE Sylvania Incorporated. Photoflash lamp. 4,105,392, Cl. 431-95.00R.
Singer Company, The: *See*—
Albert, William Charles; and Hohenstein, Robert Mark, 4,104,920, Cl. 73-517.0AV.
Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,104,976, Cl. 112-121.110.
Pross, John William, Jr., 4,106,105, Cl. 364-900.000.
Singer, Lewak, Greenbaum and Goldstein: *See*—
Gelinas, Ralph J. (Ralph J. Gelinas, a part interest to each assors. to), 4,105,346, Cl. 403-104.000.
Sivertsen, Marvin L.: *See*—
Pury, Thomas; Gray, Floyd L.; Sivertsen, Marvin L.; Konle, Robert L.; and Stehr, Richard E., 4,105,920, Cl. 250-402.000.
Sjostrom, Otto Einar. Holding-on device. 4,104,936, Cl. 81-180.00R.
Skilliter, Robert T., Jr., to Acme Specialty Manufacturing Company, The. Mirror assembly with frangible angular projections. 4,105,295, Cl. 350-303.000.
Skinner, Charles E.: *See*—
Clark, William H.; and Skinner, Charles E., 4,105,617, Cl. 260-31.20N.
Skinner Irrigation Co.: *See*—
Eby, Ralph H., 4,105,186, Cl. 251-35.000.
Skinner, James L., to Atlantic Richfield Company. Inclined conveyor belt solids separating system with responsive gas control. 4,105,124, Cl. 209-114.000.
Skoda, Stanislav: *See*—
Mikulecky, Karel; Tyl, Miloslav; Janousek, Jan; Burysek, Frantisek; Skoda, Stanislav; and Esner, Stanislav, 4,104,854, Cl. 57-34.00R.
Skotheim, Terje A., to United States of America, Energy. Dye-sensitized Schottky barrier solar cells. 4,105,470, Cl. 136-89.0SJ.
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, to Schering Aktiengesellschaft. Prostane dervatives. 4,105,792, Cl. 424-313.000.
Slater Electric Inc.: *See*—
Hoehn, Rudolph H., 4,105,862, Cl. 174-53.000.
Slater, John Walter: *See*—
Collins, David John; Kay, Ian Trevor; and Slater, John Walter, 4,105,433, Cl. 71-93.000.
Slingluff, Eugene L., to Krandex Corp. Radiographic opaque and conductive striped medical tubes. 4,105,732, Cl. 264-104.000.
Smallwood, John J., to Fairchild Industries, Inc. Valve apparatus. 4,105,047, Cl. 137-625.600.
Smeltzer, Paul; Sharma, Kris; Daneck, David A.; and McNally, Sellers B., to Maremont Corporation. Pump mechanism for a combined self-leveling shock absorber and fluid spring unit. 4,105,194, Cl. 267-64.00R.
Smilenov, Todor Ivanov: *See*—
Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.
Smith, Curtis P., to Upjohn Company, The. Preparation of carbodiimide in presence of phospholene catalysts. 4,105,642, Cl. 528-51.000.

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Smith, George Arthur: *See—*
Ferris, Donald Leroy; and Smith, George Arthur, 4,105,365, Cl. 416-107.000.
Smith, Ian, to British Gas Corporation. Pipeline inspection vehicle for detecting defects in pipeline walls. 4,105,972, Cl. 324-220.000.
Smith International, Inc.: *See—*
Allen, James H., 4,105,083, Cl. 175-313.000.
Smith, James D. B.; and Kauffman, Robert N., to Westinghouse Electric Corp. High voltage device containing a flexible prepreg. 4,105,984, Cl. 336-60.000.
Smith, James George; and Reed, Ralph Clyde, to Eastman Kodak Company. Photothermographic material, composition and process. 4,105,451, Cl. 96-66.00T.
Smith, Judson L. Vehicle floor mat washer. 4,104,755, Cl. 15-40.000.
Smith Kline & French Laboratories Limited: *See—*
Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, 4,105,770, Cl. 424-263.000.
Smith, Malcolm John; Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, to Ciba Geigy (UK) Limited. Treatment of aqueous systems. 4,105,551, Cl. 210-58.000.
Smith, William R.; and Duchild, Robert H., to United States of America, Navy. Breakaway link assembly for maintaining a structural alignment of shock-sensitive equipment. 4,105,177, Cl. 248-15.000.
Smithen, Carey Ernest: *See—*
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,105,852, Cl. 548-342.000.
Smolin, Lewis M.: *See—*
Theodores, Theodore P.; and Smolin, Lewis M., 4,105,205, Cl. 273-73.00J.
Snam Progetti, S.p.A.: *See—*
Balducci, Agostino; Corbellini, Margherita; Mormino, Vittorio; Notari, Bruno; and Rivola, Luigi, 4,105,588, Cl. 252-454.000.
Snell, Spencer Allan: *See—*
Gibson, David Kent; Miller, Myrl J.; and Snell, Spencer Allan, 4,105,327, Cl. 355-59.000.
Sobotta, Reinhard, to Rollei-Werke Franke & Heidecke. Circular magazine for linear magazine slide projectors. 4,105,317, Cl. 353-117.000.
Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Radici, Pierino; Custro, Sergio; Ermoni, Mario; and Colombo, Paolo, 4,105,638, Cl. 528-130.000.
Vargiu, Silvio; Manzoni, Pier Luigi; Bernasconi, Mario; and Parodi, Antonio, 4,105,604, Cl. 260-17.200.
Societe Anonyme de Telecommunications: *See—*
Aveneau, Andre A.; and Barbier, Xavier N., 4,105,869, Cl. 179-15.0BD.
Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques Saviem: *See—*
Baguelin, Yves, 4,104,993, Cl. 123-41.490.
S.A. des Etablissements Francois Salomon & Fils: *See—*
Salomon, Georges Pierre Joseph, 4,104,766, Cl. 24-69.0SK.
Salomon, Georges Pierre Joseph, 4,104,811, Cl. 36-121.000.
Societe Chimique des Charbonnages: *See—*
Machon, Jean-Pierre; Levresse, Bernard; and Gloriod, Pierre, 4,105,609, Cl. 260-23.00H.
Societe Chimique des Charbonnages-CdF Chimie: *See—*
Nicco, Adrien; and Machon, Jean-Pierre, 4,105,842, Cl. 526-65.000.
Societe de Vente de l'Aluminium Pechiney: *See—*
Charbonnier, Jean, 4,105,191, Cl. 266-88.000.
Societe d'Etude et de Construction de Machines pour Toutes Industries S.E.C.O.M.A.S.A.: *See—*
Perraud, Raymond Jean, 4,105,081, Cl. 175-122.000.
Societe d'Etudes Chimiques: *See—*
Caillol, Alain, 4,105,751, Cl. 423-478.000.
Societe Nationale des Petroles d'Aquitaine: *See—*
Gibert, Alain, 4,106,084, Cl. 363-21.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Caruel, Jacques E. J.; and Stora, Guy D., 4,104,874, Cl. 60-39.650.
Soding, Bernward; and Freisleben, Reinhard, to Soding TV GmbH & Co. Bild & Ton International. Film strip projection apparatus. 4,105,316, Cl. 353-109.000.
Soding TV GmbH & Co. Bild & Ton International: *See—*
Soding, Bernward; and Freisleben, Reinhard, 4,105,316, Cl. 353-109.000.
Sohner, Gerhard: *See—*
Jundt, Werner; Werner, Peter; Bodig, Bernd; Sohner, Gerhard; and Roth, Helmut, 4,105,006, Cl. 123-148.00E.
Sokol, Gunter: *See—*
Hagenlocher, Walter; Neumann, Karl-Heinz; Muller, Martin; Kleebaur, Karl; Sokol, Gunter; and Molt, Jurgen, 4,105,907, Cl. 310-232.000.
Solid State Scientific Inc.: *See—*
Stickel, Tedd, 4,104,860, Cl. 58-23.00R.
Solitron Devices, Inc.: *See—*
Hamzawi, Fawzi J., 4,105,476, Cl. 148-187.000.
Soma, Nobuo: *See—*
Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,105,626, Cl. 260-45.8NZ.
Somers, Aloijsius Gerardus: *See—*
de Ramaix, Maurice Antoine; and Somers, Aloijsius Gerardus, 4,105,533, Cl. 204-301.000.
Sony Corporation: *See—*
Hoshido, Mutsuo, 4,106,064, Cl. 360-60.000.
Matsumoto, Isao; and Yamaguchi, Haruhisa, 4,105,936, Cl. 318-328.000.
Nagumo, Fumio; and Yamanaka, Seisuke, 4,106,056, Cl. 358-50.000.
Sopira, Michael M.: *See—*
Nathanson, Harvey C.; and Sopira, Michael M., 4,106,046, Cl. 357-30.000.
Sorensen, Robert Keith; and Rallis, Anthony T., to Dresser Industries, Inc., by said Robert Keith Sorensen. Journal and pilot bearings with alternating surface areas of wear resistant and anti-galling materials. 4,105,263, Cl. 308-8.200.
Sorenson, Paul H., to Universal Oil Products Company. Lightweight, closed-cell foam elastomeric elements for use in countercurrent gas-liquid contact operations. 4,105,722, Cl. 261-94.000.
Sorimachi, Kanehiro: *See—*
Ito, Fumio; Ito, Tadashi; Sunouchi, Akio; and Sorimachi, Kanehiro, 4,106,040, Cl. 354-205.000.
Soulos, Steven T. Weightlifting game. 4,105,206, Cl. 273-85.00R.
Spar Aerospace Products Limited: *See—*
Mee, Francis Herbert Arthur, 4,105,241, Cl. 294-86.00R.
Sparlin, Derry D.: *See—*
Sifferman, Thomas R.; and Sparlin, Derry D., 4,105,618, Cl. 260-33.6UA.
Spellman, Michael Thomas, to Wallace Murray Corporation. Twisted flex fan. 4,105,366, Cl. 416-132.00A.
Spence, Gordon; Hemmens, Cecil Godfrey; and Godfrey, Alan, to Plessey Handel und Investments AG. Potentiometers. 4,105,987, Cl. 338-130.000.
Spencer, Benjamin B., to Buckeye International, Inc. Wear surface arrangement for coupler carrier assembly. 4,105,128, Cl. 213-61.000.
Sperry Rand Corporation: *See—*
Ignasiak, Stanley F., 4,105,909, Cl. 313-473.000.
Sperry Rand Limited: *See—*
Bone, Geoffrey Edward; and Allen, Peter Baguley, 4,104,877, Cl. 60-230.000.
Springer, Richard Allen: *See—*
Melanson, John Laurence; Springer, Richard Allen; Grimes, Jack Duane; and Gilmore, Jack Arthur, 4,106,011, Cl. 340-365.00E.
SPS Technologies, Inc.: *See—*
Sigmund, Jerry A., 4,104,779, Cl. 29-407.000.
Sigmund, Jerry A., 4,104,780, Cl. 29-407.000.
Sta-Rite Industries: *See—*
Francis, Ralph M., Jr., 4,105,367, Cl. 417-36.000.
Stach, Kurt, deceased: *See—*
Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased; Thiel, Max; and Vomel, Wolfgang, 4,105,772, Cl. 424-269.000.
Stachejko, Vitaly, to RCA Corporation. Amplitude balanced diode phase shifter. 4,105,959, Cl. 333-31.00R.
Stachurski, Zbigniew Henryk: *See—*
Atkin, Howard Dawson; Stachurski, Zbigniew Henryk; and Cherry, Brian Wilson, 4,105,117, Cl. 206-501.000.
Stahl, Quade R., to Meloy Laboratories, Inc. Catalytic converter apparatus, especially for oxides of nitrogen. 4,105,413, Cl. 23-288.00R.
Stahle, Helmut: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Reichl, Richard; and Giesemann, Rolf, 4,105,796, Cl. 424-330.000.
Kummer, Werner; Stahle, Helmut; Koppe, Herbert; Haarmann, Walter; and Reichl, Richard, 4,105,765, Cl. 424-248.560.
Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Vibration damping bearing arrangement. 4,105,265, Cl. 308-158.000.
Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,105,265, Cl. 308-158.000.
Stal-Laval Turbin AB: *See—*
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Stalfors, Rolf Lennart: *See—*
Blomqvist, Ake Hugo Petrus; and Stalfors, Rolf Lennart, 4,105,174, Cl. 244-3.160.
Staller, Manfred: *See—*
Ade, Rolf; Schubert, Karl-Friedrich; and Staller, Manfred, 4,105,906, Cl. 310-87.000.
Standard Havens, Inc.: *See—*
Rheinfrank, Lamson, Jr.; Bundy, Richard P.; and Clements, Jack T., 4,105,421, Cl. 55-379.000.
Standard Oil Company (Indiana): *See—*
Hoff, Glen R.; Fotis, Peter, Jr.; and Boone, David E., 4,105,846, Cl. 526-124.000.
Wolff, William F., 4,105,251, Cl. 299-2.000.
Standridge, Robert Ted: *See—*
Partyka, Richard Anthony; Standridge, Robert Ted; Howell, Henry George; and Shulgin, Alexander Theodore, 4,105,695, Cl. 260-570.80R.
Starks, Charles M.; and Lundeen, Allan J., to Continental Oil Company. Preparation of cinnamyl-substituted phenols. 4,105,698, Cl. 568-744.000.
Starks, Charles M., to Continental Oil Company. Preparation of o-benzylphenol. 4,105,699, Cl. 568-744.000.
State of Rhode Island, Board of Regents for Education of the: *See—*
Jahns, Frederick D.; and Rand, Arthur G., Jr., 4,105,800, Cl. 426-61.000.
Stavrinou, Stavros C., to Armstrong Cork Company. Method of reclaiming waste sheet flooring. 4,105,593, Cl. 260-2.300.
Steenson, Thomas W.; and Paton, W. Donald, to Butler Manufacturing Company. Lifting device for large panels. 4,105,240, Cl. 294-81.00R.
Steffens, Charles J.: *See—*
Rieth, James E.; and Steffens, Charles J., 4,104,917, Cl. 73-343.00R.

Stehr, Richard E.: *See—*
Pury, Thomas; Gray, Floyd L.; Sivertsen, Marvin L.; Konle, Robert L.; and Stehr, Richard E., 4,105,920, Cl. 250-402.000.
Steinbock, Rolf. Variable compression engine. 4,104,995, Cl. 123-78.00D.
Stella, Joseph A.: *See—*
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Stemme, Otto: *See—*
Wick, Richard; Stemme, Otto; Lermann, Peter; and Schultheiss, Karl-Heinz, 4,106,036, Cl. 354-83.000.
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Stenzel, Karl-Jorg: *See—*
Borchert, Lothar; and Stenzel, Karl-Jorg, 4,105,828, Cl. 428-665.000.
Stephenson, James E.: *See—*
Miller, Glynn; and Stephenson, James E., 4,105,566, Cl. 252-8.100.
Sterling Drug Inc.: *See—*
Alexander, E. John, 4,105,764, Cl. 424-248.540.
Alexander, E. John, 4,105,766, Cl. 424-251.000.
Archer, Sydney, 4,105,659, Cl. 260-293.540.
Williams, William D., 4,105,148, Cl. 222-478.000.
Sterling, Vaughn C.; and Schupp, Lewis J., to General Electric Company. Flashlamp composition. 4,105,480, Cl. 149-40.000.
Sterzel, Hans-Josef: *See—*
Boehlke, Klaus; Welz, Martin; Foerster, Peter; Sterzel, Hans-Josef; Wurmb, Rolf; and Matthies, Hans Georg, 4,105,624, Cl. 260-40.00R.
Stevick, Ronald A. Gravel processing system. 4,105,544, Cl. 209-317.000.
Stewart, Hal W. Tape dispensing apparatus. 4,105,149, Cl. 225-25.000.
Stickel, Tedd, to Solid State Scientific Inc. High speed dynamic flip-flop system. 4,104,860, Cl. 58-23.00R.
Stickma A/S: *See—*
Morch, Ole Christian, 4,105,384, Cl. 425-126.00S.
Stievenart, Emile Frans; Deconinck, Hugo Frans; and Ceuppens, Willy Gabriel, to AGFA-GEVAERT N.V. Dispenser for sheet-like material. 4,105,198, Cl. 271-14.000.
Stiot, Jean-Pierre Henri: *See—*
Brouard, Claude Marie Henri Emile; Dupont, Bernard; Leroy, Jean-Marie Louis; and Stiot, Jean-Pierre Henri, 4,105,653, Cl. 260-158.000.
Stocker, August: *See—*
Arni, Urs; Faucci, Adriano; and Stocker, August, 4,105,688, Cl. 260-465.80R.
Stokes, Jr. Bernard E.: *See—*
Amrein, Wayne Thomas; and Stokes, Jr. Bernard E., 4,104,752, Cl. 7-107.000.
Stolarczyk, Larry G., to A. R. F. Products, Inc. Biochemical oxygen demand measuring device. 4,105,523, Cl. 204-195.00B.
Stoll, Max: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,105,661, Cl. 544-405.000.
Stoops, Roscoe D. Flat wrench extender tool. 4,104,935, Cl. 81-177.00A.
Stora, Guy D.: *See—*
Caruel, Jacques E. J.; and Stora, Guy D., 4,104,874, Cl. 60-39.650.
Stotler, James L. Credit card washing device. 4,104,758, Cl. 15-104.920.
Stournas, Stamoulis; and Dickert, Joseph J., Jr., to Mobil Oil Corporation. Oil recovery by surfactant waterflooding. 4,105,570, Cl. 252-8.55D.
Stoyanov, Yossif Genchev: *See—*
Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.
Strathearn Audio Limited: *See—*
Plummer, Dexter Robert; and Jones, Roderick Frank, 4,105,961, Cl. 318-676.000.
Stratton, Lawrence J.; Jeffreys, Dennis C.; Welz, Albert W., Jr.; and Johnston, Reed H., to New England Power Service Company. Cycloconverter apparatus and method for working into an active load. 4,105,897, Cl. 307-3.000.
Stratton, Lawrence J.: *See—*
Johnston, Reed H.; Jeffreys, Dennis C.; and Stratton, Lawrence J., 4,106,007, Cl. 340-310.00A.
Strausak, Benedikt A.: *See—*
Laeng, Rudolf; Strausak, Benedikt A.; and Vavrina, Josef, 4,106,082, Cl. 362-87.000.
Stribiak, John J., Jr., to Stribiak, John J., Jr.; and Swanson, John. Snow blower for powered lawn mowers. 4,104,812, Cl. 37-43.00L.
Stright, Robert R. Article handling implement. 4,105,238, Cl. 294-11.000.
Strojni a traktorova stanice v Zatci, narodni podnik Zatec: *See—*
Jakl, Vladimir; Cink, Josef; and Bacovsky, Filip, 4,104,823, Cl. 47-1.00R.
Stubbe, Paul L. Extruder screw valve. 4,105,147, Cl. 222-413.000.
Sturgis, Clifford M. Detachable fluid coupling. 4,105,046, Cl. 137-594.000.
Stutzke, Paul: *See—*
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Suchanek, Walton F., Jr.: *See—*
Dyroff, David R.; and Suchanek, Walton F., Jr., 4,105,756, Cl. 424-48.000.
Sud-Chemie Aktiengesellschaft: *See—*
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Sudbury Engineering Corporation: *See—*
Theodores, Theodore P.; and Smolin, Lewis M., 4,105,205, Cl. 273-73.00J.
Sugalski, Raymond Kazimir, to General Electric Company. An electrochemical battery comprising a plate having stippled substrate. 4,105,832, Cl. 429-94.000.
Sugisaki, Tsutomu: *See—*
Masuyama, Kenichi; Sugisaki, Tsutomu; Kitamoto, Tatsuji; and Yamada, Yasuyuki, 4,106,067, Cl. 360-137.000.
Sukornick, Bernard: *See—*
Sweeney, Richard F.; Peterson, James O.; Sukornick, Bernard; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,105,691, Cl. 260-530.00R.
Sumitomo Chemical Company, Limited: *See—*
Mukaiyama, Teruaki; Usui, Masahiro; and Saigo, Kazuhiko, 4,105,673, Cl. 260-343.000.
Takahashi, Shigeo; and Ito, Michio, 4,104,798, Cl. 32-12.000.
Sumitomo, Ushigoro. Plastic molding assembly for molding plastic products. 4,105,184, Cl. 249-79.000.
Sun, Shan C.; and Church, Larry L., to Westinghouse Electric Corp. Apparatus for protection against subsynchronous currents in a power system. 4,106,071, Cl. 361-79.000.
Sun Ventures, Inc.: *See—*
Moore, Robert E.; and Clark, Leland C., Jr., 4,105,798, Cl. 424-352.000.
Sunahara, Takatoshi, to Kabushiki Kaisha Izumiseiki Seisakusho. Stripper for coated wires. 4,104,791, Cl. 30-90.100.
Sunds Aktiebolag: *See—*
Pettersson, Bengt Edvard, 4,105,494, Cl. 162-19.000.
Sunobe, Kazuhiro: *See—*
Mishina, Haruo; Sunobe, Kazuhiro; and Fujie, Kunio, 4,105,372, Cl. 417-243.000.
Sunouchi, Akio: *See—*
Ito, Fumio; Ito, Tadashi; Sunouchi, Akio; and Sorimachi, Kanehiro, 4,106,040, Cl. 354-205.000.
Super Chuck, Inc.: *See—*
Sciola, Joseph; and Nagy, Gabor, 4,105,171, Cl. 242-68.400.
Sutton, Theodore Leonard, to Akzona Incorporated. Center spacing gauge for friction twisting units. 4,104,856, Cl. 57-77.400.
Suzuki, Gyoichi; Miura, Mitsutoshi; Miyazu, Takashi; Matsushita, Taro; and Okuyama, Yasuo, to Nippon Kokan Kabushiki Kaisha. Method for producing metallurgical coke. 4,105,501, Cl. 201-6.000.
Suzuki, Kisaku: *See—*
Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; Umemoto, Sueo; and Suzuki, Kisaku, 4,105,511, Cl. 204-38.00A.
Suzuki, Masaki: *See—*
Arai, Kazuo; Igarashi, Yoshiaki; Suzuki, Masaki; Sano, Nobuya; and Yosumi, Toshikazu, 4,105,935, Cl. 318-314.000.
Suzuki, Masayoshi; Ooimi, Tatuo; Yabe, Toshinori; and Takahashi, Shoji, to Bridgestone Tire Company Limited. Process of and an apparatus for producing green tires. 4,105,487, Cl. 156-405.00R.
Suzuki, Shigeto, to Chevron Research Company. Cyanoethylation of glycolic esters. 4,105,687, Cl. 260-465.400.
Suzuki, Takashi, to Matsushita Electric Industrial Co., Ltd. Process for producing porous polymer film. 4,105,737, Cl. 264-154.000.
Swaine, James W., Jr.; Low, William W.; and Bean, Samuel L., to Allied Chemical Corporation. Production of high purity calcium thiosulfate. 4,105,754, Cl. 423-514.000.
Swanson, John: *See—*
Stribiak, John J., Jr., 4,104,812, Cl. 37-43.00L.
Swart, Daniel J.; and Kelyman, Jacqueline S., to Dow Chemical Company, The. Alternating copolyestercarbonate resins. 4,105,633, Cl. 528-176.000.
Sweeney, Richard F.; Peterson, James O.; Sukornick, Bernard; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., to Allied Chemical Corporation. Process for the production of chlorofluorinated carboxylic acids. 4,105,691, Cl. 260-530.00R.
Sweeny, James G.: *See—*
Iacobucci, Guillermo A.; and Sweeny, James G., 4,105,675, Cl. 260-345.200.
Swift Agricultural Chemicals Corporation: *See—*
Wilson, Robert A.; and Raden, David J., 4,105,749, Cl. 423-320.000.
Swingline Inc.: *See—*
Van Wagener, Raymond H.; Raasch, Ernest M.; and Loos, Elsio J., 4,105,196, Cl. 270-58.000.
Sybron Corporation: *See—*
Biver, William Ralph, 4,105,411, Cl. 23-253.00R.
Synnott, John C.; and Ross, James W., Jr., to Orion Research Incorporated. Internal standard electrolyte for ammonia sensor. 4,105,525, Cl. 204-195.00P.
Syntex Puerto Rico, Inc.: *See—*
Lundquist, Ingemar H., 4,105,027, Cl. 128-206.000.
Syntex (U.S.A.) Inc.: *See—*
Kercso, Josef E., 4,105,030, Cl. 128-217.000.
Szejtli, Jozsef; Dosa, Eva; Tassonyi, Edomer; David, Agoston; and Nagy, Nee Zsuzsanna. Local anaesthetic salts of chondroitinsulfate compounds. 4,105,760, Cl. 424-180.000.
Tachibana, Histaro; Fujii, Hisashi; and Sezaki, Tamotsu, to Kawasaki Jukogyo Kabushiki Kaisha. Muffler for exhaust gases. 4,105,090, Cl. 181-265.000.

Tachibana, Kyozaburo: *See*—
Takeno, Tsuneyuki; Iwasaki, Tetsuji; Miyamoto, Norioki; Tachibana, Kyozaburo; and Matsukane, Masamoto, 4,105,436, Cl. 71-103.000.
Tackett, DeForest. Lawn clipping vacuum collector. 4,104,852, Cl. 56-202.000.
Tago, Atsuo; Yamanaka, Ryoichi; and Matsumoto, Susumu, to Kyoritsu Yuki Co., Ltd.; and Mitsubishi Chemical Industries Ltd. Process for removing water from water soluble polymer. 4,105,510, Cl. 203-14.000.
Takada, Nobuo: *See*—
Terui, Gyozo; Takada, Nobuo; and Sawada, Shuzo, 4,105,804, Cl. 426-656.000.
Takahashi, Akio; and Saito, Hirokichi, to Ihara Chemical Industry Co. Ltd. Mixing apparatus. 4,106,115, Cl. 366-138.000.
Takahashi, Katuo: *See*—
Sato, Kazukiyo; Takahashi, Katuo; Kubota, Junjiro; and Tsuchiya, Keiji, 4,105,199, Cl. 271-122.000.
Takahashi, Ryohei: *See*—
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, 4,105,435, Cl. 71-94.000.
Takahashi, Shigeo; and Ito, Michio, to Sumitomo Chemical Company, Limited; and Matsumoto Dental College. Porcelain fused to metal crown. 4,104,798, Cl. 32-12.000.
Takahashi, Shoji: *See*—
Suzuki, Masayoshi; Ooimi, Tatuo; Yabe, Toshinori; and Takahashi, Shoji, 4,105,487, Cl. 156-405.00R.
Takahashi, Susumu; and Kurata, Hirotaka, to Sansui Electric Co., Ltd. AM stereophonic transmission system. 4,105,868, Cl. 179-15.0BT.
Takahashi, Tadashi; Morinaga, Shigeki; and Kubokura, Kuniaki, to Hitachi, Ltd. Protective device in a motor-operated sewing machine. 4,104,978, Cl. 112-277.000.
Takazawa, Yuzuru: *See*—
Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, 4,104,859, Cl. 58-23.00D.
Takeda Chemical Industries, Ltd.: *See*—
Noguchi, Shunsaku; Takei, Saburo; and Kawano, Yasuhiko, 4,105,670, Cl. 260-326.11R.
Takeda, Mitsuo: *See*—
Tanaka, Nobuyoshi; Ayata, Naoki; Takeda, Mitsuo; Matsumura, Susumu; and Matsumoto, Kazuya, 4,105,335, Cl. 356-108.000.
Takeda, Tetuo: *See*—
Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; Takeda, Tetuo; and Eiro, Seiji, 4,105,474, Cl. 148-12.00F.
Takei, Saburo: *See*—
Noguchi, Shunsaku; Takei, Saburo; and Kawano, Yasuhiko, 4,105,670, Cl. 260-326.11R.
Takeno, Shouzou: *See*—
Tashiro, Mitsuhiko; Takeno, Shouzou; Mihara, Kakuo; and Kinoshita, Tadayoshi, 4,105,892, Cl. 219-216.000.
Takeno, Tsuneyuki; Iwasaki, Tetsuji; Miyamoto, Norioki; Tachibana, Kyozaburo; and Matsukane, Masamoto, to Kao Soap Co., Ltd. Herbicide. 4,105,436, Cl. 71-103.000.
Takeuchi, Akihiro: *See*—
Asai, Kiyokazu; and Takeuchi, Akihiro, 4,105,004, Cl. 123-141.000.
Takeuchi, Junji; Itou, Shigeru; and Itou, Kousuke, to Ube Industries, Ltd. Catalyst and process for reducing nitrogen oxides. 4,105,745, Cl. 423-239.000.
Takeuchi, Kazuo: *See*—
Oda, Takaaki; and Takeuchi, Kazuo, 4,105,223, Cl. 280-752.000.
Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,105,658, Cl. 260-239.30T.
Takita, Kiyoshi: *See*—
Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, 4,105,693, Cl. 260-558.00P.
Talbot, Edward Butterfield, to Ruckluft Patent AG. Contact packing. 4,105,724, Cl. 261-112.000.
Tam, William A., to Chicago Bridge & Iron Company. Apparatus for producing oil and gas offshore. 4,105,068, Cl. 166-355.000.
Tamehiro, Hiroshi: *See*—
Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; Takeda, Tetuo; and Eiro, Seiji, 4,105,474, Cl. 148-12.00F.
Tanabe, Yasuo, to Mitsubishi Chemical Industries Ltd. Process for producing a cylic ether from an acetic ester of a 1,4-glycol. 4,105,679, Cl. 260-346.110.
Tanahashi, Toshio: *See*—
Hosono, Akira; Isogai, Yoshihisa; Hasegawa, Hitoshi; and Tanahashi, Toshio, 4,104,996, Cl. 123-90.430.
Tanaka, Nobuyoshi; Ayata, Naoki; Takeda, Mitsuo; Matsumura, Susumu; and Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Interferometric optical phase discrimination apparatus. 4,105,335, Cl. 356-108.000.
Tanei, Tadayoshi; Nakamura, Shigeki; and Hotta, Masahiro, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Extruded electrophotographic recording material. 4,105,449, Cl. 96-1.800.
Tani, Katsuya: *See*—
Yasuda, Hiroshi; Tani, Katsuya; and Nagatamo, Jiro, 4,105,740, Cl. 264-290.00T.
Tani, Tadaaki, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion spectrally sensitized with merocyanine dyes. 4,105,454, Cl. 96-122.000.
Tankel, Lawrence, to Car Cuf Industries, Inc. Vehicle steering column ignition lock protective device. 4,104,895, Cl. 70-237.000.
Tashiro, Mitsuhiko; Takeno, Shouzou; Mihara, Kakuo; and Kinoshita, Tadayoshi, to Tokyo Shibaura Electric Co., Ltd. Thin resistor film type thermal head for printing on heat-sensitive paper. 4,105,892, Cl. 219-216.000.
Tassonyi, Edomer: *See*—
Szejtli, Jozsef; Dosa, Eva; Tassonyi, Edomer; David, Agoston; and Nagy, Nee Zsuzsanna, 4,105,760, Cl. 424-180.000.
Tate, George W., Jr. Automatic refraction apparatus and method. 4,105,302, Cl. 351-7.000.
Taupin, Dominique Yves Marie: *See*—
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Taylor, Ian Charles, to Imperial Chemical Industries Limited. Production of aromatic polyethers. 4,105,636, Cl. 528-126.000.
Taylor, James Franklin: *See*—
Mendoza, Gregory E.; Henthorn, Donald Ray; and Taylor, James Franklin, 4,105,188, Cl. 254-10.500.
Taylor, Lloyd D.: *See*—
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Taylor, Paul D., to Celanese Corporation. Production of tetrahydrofuran. 4,105,677, Cl. 260-346.110.
Taylor, Paul D., to Celanese Corporation. Synthesis of tetrahydrofuran. 4,105,678, Cl. 260-346.110.
Taylor, William Hunter: *See*—
Maslen, John; and Taylor, William Hunter, 4,105,621, Cl. 260-37.00N.
Technigaz: *See*—
Kotcharian, Michel, 4,105,819, Cl. 428-213.000.
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Cleary, Edward Joseph, Jr.; and Reiney, Michael Goodwin, 4,105,932, Cl. 315-377.000.
Hill, James A.; and Hargis, David R., 4,105,176, Cl. 248-13.000.
Melanson, John Laurence; Springer, Richard Allen; Grimes, Jack Duane; and Gilmore, Jack Arthur, 4,106,011, Cl. 340-365.00E.
Tele-Quik, Inc.: *See*—
Breitbard, Elford Barnett, 4,105,181, Cl. 248-452.000.
Teledyne, Inc.: *See*—
Finley, William Solon, 4,104,950, Cl. 84-462.000.
Teledyne Industries, Inc.: *See*—
Berkovitz, Robert A., 4,105,864, Cl. 179-1.00J.
Megy, Joseph Allen; and Propst, Richard Lee, 4,105,469, Cl. 134-3.000.
Teodoro, Donald J.: *See*—
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Teradyne, Inc.: *See*—
Katz, Jonathon H., 4,105,970, Cl. 324-158.00P.
Teranishi, Takao: *See*—
Hohsho, Yukio; Karino, Kimiji; Momono, Masakichi; Oyama, Yoshishige; Yamauchi, Teruo; and Teranishi, Takao, 4,105,720, Cl. 261-34.00A.
Terbeek, Howard G. Mobile chair. 4,105,242, Cl. 296-20.000.
Terui, Gyozo; Takada, Nobuo; and Sawada, Shuzo, to Terui, Gyozo. Method for separation of bacteria cells from culture broth. 4,105,804, Cl. 426-656.000.
Tetsuro, Mano, to Totai Company Limited. Apparatus for cutting a string of sausage links. 4,104,763, Cl. 17-1.00F.
Texaco Exploration Canada Ltd.: *See*—
Anderson, Clarence E., 4,105,049, Cl. 138-44.000.
Texaco Inc.: *See*—
Howlett, Donald L., 4,106,010, Cl. 340-347.0AD.
Texas Instruments Incorporated: *See*—
Williams, Clark R., 4,104,858, Cl. 58-23.00A.
Textron Inc.: *See*—
Kaplan, Stephen J.; and Gaba, Rodolfo, 4,105,562, Cl. 210-232.000.
Labecki, Karl W., 4,104,768, Cl. 24-207.000.
Sheldon, John D.; and Textron Inc., 4,104,796, Cl. 30-276.000.
Th. Goldschmidt AG: *See*—
Antoni, Gerhard, 4,105,820, Cl. 428-213.000.
Koerner, Gotz; and Patzke, Hans-Jurgen, 4,105.567, Cl. 252-8.600.
Thame, Neville G.: *See*—
Lundberg, Robert D.; and Thame, Neville G., 4,104,824, Cl. 47-58.000.
Thanos, Theologos E., to Westvaco Corporation. Non-crystallizing rosin. 4,105,462, Cl. 106-218.000.
Thelen, Arthur Bertram: *See*—
Heintz, Dennis Ronald; and Thelen, Arthur Bertram, 4,104,840, Cl. 52-309.900.
Theodores, Theodore P.; and Smolin, Lewis M., to Sudbury Engineering Corporation. Racket. 4,105,205, Cl. 273-73.00J.
Therond, Jean-Paul, to Commissariat a l'Energie Atomique. Method and device for electronic control with positive safety. 4,105,496, Cl. 176-19.00R.
Thiel, Alfons W.; and Hell, Hans, to Bellaplast GmbH. Apparatus for the manufacture of thin-walled shaped articles of thermoplastic material. 4,105,386, Cl. 425-217.000.
Thiel, Frank C. Lock keeper. 4,105,235, Cl. 292-341.180.
Thiel, Max: *See*—
Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased; Thiel, Max; and Vomel, Wolfgang, 4,105,772, Cl. 424-269.000.
Thom, Karl Friedrich, to Minnesota Mining and Manufacturing Company. Imidazole type curing agents. 4,105,667, Cl. 260-299.000.
Thoma, Frank, to Daimler-Benz Aktiengesellschaft. Pneumatic controller for an injection pump, especially for diesel engines. 4,105,002, Cl. 123-140.0MP.
Thomas, George L., to General Electric Company. High-temperature glass composition. 4,105,826, Cl. 428-379.000.

Thomas, Heinz: *See—*
Muller, Erwin; and Thomas, Heinz, 4,105,600, Cl. 521-129.000.
Thomas, James L.; and Volpp, Gert P., to FMC Corporation. Flame-retardant copolymers. 4,105,710, Cl. 260-869.000.
Thomas, Michel: *See—*
Romeas, Rene; and Thomas, Michel, 4,106,058, Cl. 358-128.000.
Thomas, Norman Stanley, to Fairclough Construction Group Limited. Tunnel lining. 4,104,885, Cl. 61-45.00R.
Thomas, William Anthony: *See—*
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,105,852, Cl. 548-342.000.
Thompson, Ida M.: *See—*
Levey, Virginius T., 4,105,233, Cl. 292-288.000.
Thompson, Lloyd E., Jr. High current density electrical contact. 4,105,280, Cl. 339-273.00S.
Thompson, Robert B.: *See—*
Alers, George A.; and Thompson, Robert B., 4,104,922, Cl. 73-643.000.
Thomson-Brandt: *See—*
Romeas, Rene; and Thomas, Michel, 4,106,058, Cl. 358-128.000.
Thomson-CSF: *See—*
Bui-Hai, Nhu; and Bourgeois, Alain, 4,106,026, Cl. 343-786.000.
Clavelloux, Noel; Peynaud, Francois; and Posseme, Gilles, 4,104,912, Cl. 73-189.000.
Lechevin, Rene; and Butin, Henri, 4,105,981, Cl. 329-50.000.
Thorn Electrical Industries Limited: *See—*
Pritchard, Eric Harry; and Passmore, Thomas Rivers, 4,105,931, Cl. 315-278.000.
Thorneburg Hosiery Mill, Inc.: *See—*
Thorneburg, James L., 4,104,892, Cl. 66-185.000.
Thorneburg, James L., to Thorneburg Hosiery Mill, Inc. Cushioned sole tube sock and method. 4,104,892, Cl. 66-185.000.
Thornsberry, Willis Lee, Jr.: *See—*
Wiewiorowski, Tadeusz Karol; and Thornsberry, Willis Lee, Jr., 4,105,741, Cl. 423-10.000.
Thrasher, George E., Jr., to Master Pneumatic-Detroit, Inc. Injection lubricating apparatus. 4,105,095, Cl. 184-55.00A.
Tillotson, LeRoy Conrad: *See—*
Arnold, Hamilton Webster; Tillotson, LeRoy Conrad; and Young, James Arthur, Jr., 4,105,973, Cl. 325-4.000.
Timashov, Viktor Alexandrovich: *See—*
Movchan, Boris Alexeevich; Timashov, Viktor Alexandrovich; and Kljuev, Konstantin Nikolaevich, 4,105,890, Cl. 219-121.0EB.
Timex Corporation: *See—*
Dukas, Sander G., 4,104,872, Cl. 59-79.00R.
Timo, Dominic P.; Placek, Ronald J.; Gonyea, David C.; Johnson, Lloyd H.; and Kure-Jensen, Jens, to General Electric Company. Bore stress limit index. 4,104,908, Cl. 73-117.300.
Tirenin, Ivan: *See—*
Metelow, Victor; and Tirenin, Ivan, 4,105,217, Cl. 280-28.000.
Tittes, Hans, deceased: *See—*
Schwaab, Manfred; Puschnerat, Helmut; Kluzik, Fritz; Junger, Manfred; Wilding, Ernst; and Tittes, Hans, deceased, 4,104,968, Cl. 101-415.100.
Tittes, Marga, Hans-Ulrich Tittes, Gerlach Stephan Tittes, Axel Michael Tittes, heirs: *See—*
Schwaab, Manfred; Puschnerat, Helmut; Kluzik, Fritz; Junger, Manfred; Wilding, Ernst; and Tittes, Hans, deceased, 4,104,968, Cl. 101-415.100.
Tobey, Jimmie Lee: *See—*
Hampton, Perry Dwaine; and Tobey, Jimmie Lee, 4,106,030, Cl. 346-140.00R.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Shinozaki, Satoshi; Nishi, Yoshio; and Mizutani, Yoshihisa, 4,106,049, Cl. 357-46.000.
Tashiro, Mitsuhiko; Takeno, Shouzou; Mihara, Kakuo; and Kinoshita, Tadayoshi, 4,105,892, Cl. 219-216.000.
Tolly, Milton C.: *See—*
Settineri, William J.; and Tolly, Milton C., 4,105,841, Cl. 526-62.000.
Tolman, Richard L.: *See—*
Bochis, Richard J.; and Tolman, Richard L., 4,105,767, Cl. 424-256.000.
Tolo, Incorporated: *See—*
Pease, Leroy I., 4,105,555, Cl. 210-136.000.
Tomich, Michael G. Positive hold differential. 4,104,931, Cl. 74-650.000.
Tominaga, Nobuhide: *See—*
Sekiguchi, Tetsuo; Abe, Masami; Tsuruga, Kouji; and Tominaga, Nobuhide, 4,105,627, Cl. 260-45.80N.
Tomlin, Robert Derrick, to Magnatex Limited. Vehicle rear-view mirror with support arm having indexing means at both ends. 4,105,296, Cl. 350-307.000.
Tomy Kogyo Co., Inc.: *See—*
Nakajima, Takamitsu, 4,104,821, Cl. 46-33.000.
Toomey, John, to Value Engineering Company. Collapsible road barrier. 4,104,980, Cl. 116-63.00P.
Topla, Inc.: *See—*
Nakagawa, Yasuharu, 4,105,734, Cl. 264-132.000.
Torre, Francesco. Packaging apparatus for packaging articles of different kinds within a film of a heat-shrinkable plastic material. 4,104,848, Cl. 53-184.00S.
Totai Company Limited: *See—*
Tetsuro, Mano, 4,104,763, Cl. 17-1.00F.
Tousimis, A. J.: *See—*
Horne, John E.; Van Albert, Stephen A.; and Tousimis, A. J., 4,104,808, Cl. 34-243.00R.
Toussaint, Herbert: *See—*
Dockner, Toni; Toussaint, Herbert; and Decker, Martin, 4,105,657, Cl. 260-239.00B.
Himmele, Walter; Hupfer, Leopold; Toussaint, Herbert; and Paul, Gerhard, 4,105,669, Cl. 260-307.00F.
Toyo Boseki Kabushiki Kaisha: *See—*
Yasuda, Hiroshi; Tani, Katsuya; and Nagatamo, Jiro, 4,105,740, Cl. 264-290.00T.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Hosono, Akira; Isogai, Yoshihisa; Hasegawa, Hitoshi; and Tanahashi, Toshio, 4,104,996, Cl. 123-90.430.
Nohira, Hidetaka, 4,104,879, Cl. 60-290.000.
Saito, Haruhiko; and Morishita, Michio, 4,105,719, Cl. 261-34.00B.
Trabitzsch, Hans: *See—*
Pennewiss, Horst; Plainer, Hermann; Quis, Peter; Trabitzsch, Hans; Masanek, Juergen; and Jakob, Juergen, 4,105,519, Cl. 204-159.230.
Trappe, Lieselotte: *See—*
Wapelhorst, Friedrich-Wilhelm; and Kalkoff, Heinz-Dieter, 4,105,482, Cl. 156-96.000.
Trautner, Jurgen; and Kolbe, Peter, to Siemens Aktiengesellschaft. Protection arrangement for a brushless synchronous machine. 4,106,069, Cl. 361-30.000.
Treadwell Corp.: *See—*
Muller, Albert; and Schreiner, John M., 4,105,545, Cl. 210-15.000.
Tregear, Geoffrey W.: *See—*
Colescott, Robert L.; and Tregear, Geoffrey W., 4,105,602, Cl. 260-8.000.
Treichel, Hans Herbert: *See—*
Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, 4,105,871, Cl. 179-18.0AD.
Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, 4,105,874, Cl. 179-18.0AD.
Farrell, John Francis; and Treichel, Hans Herbert, 4,105,876, Cl. 179-18.0AD.
Trepka, William J.; and Rothlisberger, Alvin C., to Phillips Petroleum Company. Coupling of alkali metal-terminated polymers. 4,105,714, Cl. 260-879.000.
Troitsky, Vladimir Alexandrovich: *See—*
Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 327-43.50S.
Trost, Wayne C.; and Darsie, Burns, to Barber-Colman Company. Modular construction for triaxial weaving machine. 4,105,052, Cl. 139-101.000.
Trumbull, Gerald M. Multi-purpose dashboard attachment. 4,105,246, Cl. 296-97.00E.
Trumpf Maschinen AG: *See—*
Herb, Eugen; Petera, Theodor; and Bitzel, Hubert, 4,104,940, Cl. 83-71.000.
Trutor, John. Articulated enclosure. 4,104,988, Cl. 119-51.00R.
TRW Inc.: *See—*
Jacobs, Leonard, 4,105,277, Cl. 339-95.00R.
Tseung, Alfred Chan Chung: *See—*
Johnson, Alan Stanley William; and Tseung, Alfred Chan Chung, 4,105,530, Cl. 204-290.00R.
Tsipouras, Panayiotis J., to Megasystems, Inc. Indicated horsepower measurement system for piston engines. 4,104,907, Cl. 73-117.300.
Tsuchikane, Yoshiyuki: *See—*
Owaki, Isao; Nakamura, Shinji; and Tsuchikane, Yoshiyuki, 4,105,213, Cl. 274-38.000.
Tsuchiya, Keiji: *See—*
Sato, Kazukiyo; Takahashi, Katuo; Kubota, Junjiro; and Tsuchiya, Keiji, 4,105,199, Cl. 271-122.000.
Tsuge, Chutatsu: *See—*
Nakamura, Junichi; Konuma, Hiroshi; Kokuryo, Shiro; Ueshima, Takashi; and Tsuge, Chutatsu, 4,105,608, Cl. 260-23.00R.
Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Large aperture zoom lens. 4,105,291, Cl. 350-184.000.
Tsukushi, Masanori; Kashimura, Katsuichi; Hirasawa, Kunio; and Yoshioka, Yoshio, to Hitachi, Ltd. Magnetic puffer type gas circuit breaker. 4,105,879, Cl. 200-148.00A.
Tsuruga, Kouji: *See—*
Sekiguchi, Tetsuo; Abe, Masami; Tsuruga, Kouji; and Tominaga, Nobuhide, 4,105,627, Cl. 260-45.80N.
Tuda, Goro; Shimizu, Katsuhiko; Murakami, Tudoi; and Nasu, Syouzi, to Kobe Steel, Ltd. Teach-in method and apparatus for use in an industrial robot. 4,105,937, Cl. 318-568.000.
Tulip, John. High repetition rate pulsed laser discharge system. 4,105,952, Cl. 331-94.5PE.
Tunnicliffe, George, to Corning Limited. Pressure vessels. 4,105,061, Cl. 165-1.000.
Turpin Systems Company: *See—*
Land, Robert Perry, 4,106,094, Cl. 364-453.000.
Turturici, Gaeton Ben. Detachable lamp assembly for dual trailer trucks. 4,106,081, Cl. 362-61.000.
Tutusaus Almao, Jose Maria. Process for the manufacture of shoes having a wooden base. 4,104,754, Cl. 12-142.00S.

Tyl, Miloslav: *See*—
Mikulecky, Karel; Tyl, Miloslav; Janousek, Jan; Burysek, Frantisek; Skoda, Stanislav; and Esner, Stanislav, 4,104,854, Cl. 57-34.00R.

Tzakis, George J., to Zenith Radio Corporation. Automatic chroma level system. 4,106,054, Cl. 358-27.000.

Ube Industries, Ltd.: *See*—
Takeuchi, Junji; Itou, Shigeru; and Itou, Kousuke, 4,105,745, Cl. 423-239.000.

Ueda, Ikuo: *See*—
Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,105,781, Cl. 424-283.000.

Ueshima, Takashi: *See*—
Nakamura, Junichi; Konuma, Hiroshi; Kokuryo, Shiro; Ueshima, Takashi; and Tsuge, Chutatsu, 4,105,608, Cl. 260-23.00R.

Ulbing, Otmar M.; and Koval, Edmund R., to Columbus McKinnon Corporation. Control station switch. 4,105,882, Cl. 200-157.000.

Ullrich, Robert L. After-cooler accessory unit for internal combustion engine having a carburetor. 4,104,999, Cl. 123-119.0CD.

Umeda, Junichiro: *See*—
Nishino, Atsushi; Hayakawa, Hayashi; Yoshida, Akihiko; and Umeda, Junichiro, 4,105,513, Cl. 204-38.00A.

Umemoto, Sueo: *See*—
Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; Umemoto, Sueo; and Suzuki, Kisaku, 4,105,511, Cl. 204-38.00A.

Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Neothramycin antibiotics. 4,105,658, Cl. 260-239.30T.

Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, to Fujisawa Pharmaceutical Co., Ltd. Chromone compounds and preparation thereof. 4,105,781, Cl. 424-283.000.

Unarco Industries, Inc.: *See*—
Baugh, Benjamin Charles; Young, Norman R.; and Runnion, Glenmore J., 4,105,096, Cl. 186-1.0AC.

Unger, Ann. Hand and finger exercise device. 4,105,200, Cl. 272-67.000.

Unican Electrochemical Products Ltd.: *See*—
Arora, Mulk Raj, 4,105,807, Cl. 427-126.000.

Union Carbide Corporation: *See*—
Berger, Sidney Ethan, 4,105,465, Cl. 106-308.00Q.
Hill, Clifford W.; Carkhuff, Donald W.; and Pilia, Frank J., 4,105,891, Cl. 219-137.430.
Kordesch, Karl Victor, 4,105,830, Cl. 429-27.000.

Union Oil Company of California: *See*—
Showalter, William E., 4,105,253, Cl. 299-4.000.

Uniroyal, Inc.: *See*—
Hunter, Byron Alexander; and Barrows, Franklin Herbert, 4,105,601, Cl. 521-95.000.

United Kingdom Atomic Energy Authority: *See*—
Dearnaley, Geoffrey; and Hartley, Nicholas Edmund Whittam, 4,105,443, Cl. 75-238.000.

United States Gypsum Company: *See*—
Agcaoili, Clarito R., 4,104,829, Cl. 49-409.000.
Latakas, Bernard; Copenhefer, John E.; and House, Robert M., 4,105,423, Cl. 55-501.000.
Nelsson, Nels, 4,104,938, Cl. 83-5.000.

United States of America
Agriculture: *See*—
Andrews, Bethlehem K.; Harper, Robert J., Jr.; and Cashen, Norton A., 4,105,403, Cl. 8-115.000.
Jasper, Martin T.; and Koch, Peter, 4,105,397, Cl. 432-90.000.
Air Force: *See*—
Wirtanen, Theodore E., 4,105,339, Cl. 356-152.000.
Army: *See*—
Almerini, Achille L., 4,105,836, Cl. 429-194.000.
Bard, Charles L.; and Pfitzenmaier, Raymond W., 4,104,953, Cl. 89-14.00E.
Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,104,771, Cl. 29-25.140.
Dunn, Ralph L., 4,106,014, Cl. 343-5.0SA.
Glendinning, William Bernard; and Mark, Albert, 4,105,805, Cl. 427-38.000.
Energy: *See*—
Bartlett, Rodney J.; and Morrey, John R., 4,105,921, Cl. 250-423.00P.
Compton, Robert N.; Reinhardt, Paul W.; and Garrett, William R., 4,105,746, Cl. 423-251.000.
Skotheim, Terje A., 4,105,470, Cl. 136-89.0SJ.
Health, Education and Welfare: *See*—
Hughes, John, 4,105,651, Cl. 260-112.50R.
Interior: *See*—
Eisele, Judith A.; and Bauer, Donald J., 4,105,747, Cl. 423-263.000.
Wasson, Joe R.; Pressley, Joseph R.; Baker, Robert W.; Fairaizl, Joseph H.; and Zorker, Richard J., 4,105,328, Cl. 355-78.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Ryason, Porter R. Solar photolysis of water. 4,105,517, Cl. 204-157.10R.
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Coffinberry, George A., 4,104,873, Cl. 60-39.28R.
Lennon, Carl L.; and Britt, Thomas O., 4,105,966, Cl. 324-113.000.
Myers, William N.; and Hein, Leopold A., 4,105,261, Cl. 308-72.000.
Navy: *See*—
Bornfleth, Jay W., 4,105,258, Cl. 303-93.000.
Jernigan, James L., 4,105,953, Cl. 331-94.50Q.
Naef, Frederick E., 4,104,883, Cl. 60-641.000.
Petersen, Gary L.; and Liedtke, Larry L., 4,104,970, Cl. 102-220.000.
Routh, Claude C., 4,105,941, Cl. 330-124.00R.
Smith, William R.; and Duchild, Robert H., 4,105,177, Cl. 248-15.000.
State: *See*—
Driscoll, John S.; Marquez, Victor E.; and Peng, Geoffrey, 4,105,774, Cl. 424-273.00R.

U.S. Philips Corporation: *See*—
Albarda, Scato; Van Der Hoek, Willem; and Taupin, Dominique Yves Marie, 4,106,029, Cl. 346-117.00A.
Barten, Piet Gerard Joseph; and Bijma, Jan, 4,105,983, Cl. 335-212.000.
Bertrams, Johannes Kurt, deceased; and Mulkens, Casper Antonius Henricus, administrator, 4,105,099, Cl. 191-29.0DM.
Lackner, Robert; Melwisch, Harald; and Kurzmann, Helfried, 4,106,063, Cl. 360-38.000.
Van Vroenhoven, Petrus Adrianus Wilhelmus, 4,106,057, Cl. 358-128.000.

United States Postal Service: *See*—
McGinn, James W., 4,105,997, Cl. 340-146.3ED.

United Technologies Corporation: *See*—
Ferris, Donald Leroy; and Smith, George Arthur, 4,105,365, Cl. 416-107.000.

Universal Oil Products Company: *See*—
Sorenson, Paul H., 4,105,722, Cl. 261-94.G00.

University College of North Wales: *See*—
Last, James David, 4,106,022, Cl. 343-105.00R.

University of California, The Regents of the: *See*—
McIver, Robert T., Jr.; and Ledford, Edward B., Jr., 4,105,917, Cl. 250-291.000.
Mehta, Povindar Kumar, 4,105,459, Cl. 106-98.000.

University of Salford: *See*—
Dave, Nalinkumar Jayantilal, 4,105,739, Cl. 264-256.000.

University of Toledo, The: *See*—
Angelbeck, Donald Irvin, 4,105,463, Cl. 106-120.000.

University of Utah: *See*—
Greenleaf, James F.; and Johnson, Steven A., 4,105,018, Cl. 128-2.00V.

University Patents, Inc.: *See*—
Hershel, Ronald S., 4,105,289, Cl. 350-162.0SF.

UOP Inc.: *See*—
Lamberts, Ervins H., 4,105,195, Cl. 267-131.000.

Upjohn Company, The: *See*—
Bundy, Gordon L., 4,105,682, Cl. 260-408.000.
Smith, Curtis P., 4,105,642, Cl. 528-51.000.
Smith, Curtis P., 4,105,643, Cl. 528-512.000.

Ursic, Thomas A.: *See*—
Antoshkiw, William T.; and Ursic, Thomas A., 4,105,022, Cl. 128-2.05F.

Urso, Charles J., to Xerox Corporation. Illuminated charge control system for xerographic machines. 4,105,321, Cl. 355-3.0CH.

Usui, Masahiro: *See*—
Mukaiyama, Teruaki; Usui, Masahiro; and Saigo, Kazuhiko, 4,105,673, Cl. 260-343.000.

Utsumi, Jihaciro, to Bell Ko-On Co., Ltd. Sound movie projector. 4,105,306, Cl. 352-14.000.

Vache, Marcel, to Application Des Gaz. Portable stoves. 4,105,013, Cl. 126-38.000.

Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., to Salk Institute for Biological Studies, The. Peptides which effect release of hormones. 4,105,603, Cl. 260-8.000.

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Sailas, Vaino, 4,104,772, Cl. 29-121.400.
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Value Engineering Company: *See*—
Toomey, John, 4,104,980, Cl. 116-63.00P.

Van Albert, Stephen A.: *See*—
Horne, John E.; Van Albert, Stephen A.; and Tousimis, A. J., 4,104,808, Cl. 34-243.00R.

VanBenthuysen, John D.; Flanders, Thomas W.; and Gietzen, John R., to CTS Corporation. Tandem electrical control. 4,105,988, Cl. 338-132.000.

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Albarda, Scato; Van Der Hoek, Willem; and Taupin, Dominique Yves Marie, 4,106,029, Cl. 346-117.00A.

van der Lely, Cornelis. Tractors and other vehicles. 4,105,085, Cl. 180-43.00R.

Vanderpool, Billy F.: *See*—
Farler, Buist A.; and Vanderpool, Billy F., 4,105,898, Cl. 307-10.0LS.

Vandervoort, John R., to Eaton Corporation. Transmission. 4,104,928, Cl. 74-331.000.

van der Werff, Bartele, to A. Vuyk & Zonen's Scheepswerven B.V. Hopper barge having a bottom discharge opening closed by hopper doors. 4,104,979, Cl. 114-36.000.

Vanderzee, Robert S.: *See*—
Hayes, Richard H.; McFarland, Lellan L.; Schrum, George L.; and Vanderzee, Robert S., 4,105,488, Cl. 156-425.000.

Vanlerberghe, Guy: *See*—
Sebag, Henri; and Vanlerberghe, Guy, 4,105,580, Cl. 252-351.000.

Van Scott, Eugene J.: *See*—
Yu, Ruey J.; and Van Scott, Eugene J., 4,105,782, Cl. 424-283.000.
Yu, Ruey J.; and Van Scott, Eugene J., 4,105,783, Cl. 424-283.000.

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Van Wagener, Raymond H.; Raasch, Ernest M.; and Loos, Elsio J., to Swingline Inc. Sheet collator device. 4,105,196, Cl. 270-58.000.

Van Wagner, Edward Milton, to Xerox Corporation. Expandable photoreceptor endbells. 4,105,345, Cl. 403-24.000.

Vargiu, Silvio; Manzoni, Pier Luigi; Bernasconi, Mario; and Parodi, Antonio, to Societa' Italiana Resine S.I.R. S.p.A. Moulding compositions containing a Novolak phenolic resin and an amine-boric acid stabilizer-catalyst. 4,105,604, Cl. 260-17.200.

Vavrina, Josef: *See*—
Laeng, Rudolf; Strausak, Benedikt A.; and Vavrina, Josef, 4,106,082, Cl. 362-87.000.

Veeck, Stewart J.; Freeman, William R.; and Dardi, Louis E., to Howmet Turbine Components Corporation. Method for consolidating precision shapes. 4,104,782, Cl. 29-527.200.

Velosa, Joseph M. Safety mat switch for machine tools and their like. 4,105,899, Cl. 307-115.000.

Velsicol Chemical Corporation: *See*—
Anderson, Arnold L.; and Nuiph, Robert J., 4,105,632, Cl. 260-45.75D.

Venero, Agustin F., to Exxon Research & Engineering Co. Metal halogen batteries and method of operating same. 4,105,829, Cl. 429-15.000.

Vereinigte Aluminium-Werke Aktiengesellschaft: *See*—
Helmrich, Gunter; and Wulfing, Fritz, 4,105,729, Cl. 264-71.000.

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Riegler, Ernst; and Schmidt, Manfred, 4,105,343, Cl. 403-15.000.

Vernaleken, Hugo: *See*—
Hardt, Dietrich; Serini, Volker; Vernaleken, Hugo; and Braese, Hans-Eberhard, 4,105,711, Cl. 260-873.000.
Margotte, Dieter; and Vernaleken, Hugo, 4,105,712, Cl. 260-873.000.

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Viall, Charles S., Sr.; Viall, Charles S., Jr.; and Viall, Harold S. Vehicle safety braking system. 4,105,237, Cl. 293-73.000.

Viall, Harold S.: *See*—
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Vickers, Michael Alan: *See*—
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Victor Company of Japan, Ltd.: *See*—
Owaki, Isao; Nakamura, Shinji; and Tsuchikane, Yoshiyuki, 4,105,213, Cl. 274-38.000.

Vigor, Charles W.: *See*—
Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., 4,104,787, Cl. 29-596.000.

Villari, Frank K.: *See*—
Libman, Gary; and Villari, Frank K., 4,105,500, Cl. 195-103.50M.

Vincent, Ogden W. Steam engine with steam heat recovery and steam compression. 4,104,869, Cl. 60-39.550.

Virag, Robert A., to Baxter Travenol Laboratories, Inc. Intravenous solution set having an air access site and constricted inner diameter portion. 4,105,029, Cl. 128-214.00R.

Visentin, Andrea. Prefabricated composable duct element. 4,105,051, Cl. 138-162.000.

Visual Marketing, Inc.: *See*—
Deffner, John F.; Wendel, Donald W.; and Barnes, Russell M., 4,105,126, Cl. 211-49.00D.

Vitt, Theodor: *See*—
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Vliet, Walter Carl, to Ingersoli-Rand Company. Method and apparatus for fastener tensioning. 4,104,778, Cl. 29-407.000.

Volkswagenwerk Aktiengeselischaft: *See*—
Haar, Richard, 4,105,236, Cl. 293-71.00R.

Volpp, Gert P.: *See*—
Thomas, James L.; and Volpp, Gert P., 4,105,710, Cl. 260-869.000.

Volstatic of Canada Limited: *See*—
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Vomel, Wolfgang: *See*—
Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased; Thiel, Max; and Vomel, Wolfgang, 4,105,772, Cl. 424-269.000.

VonKrusenstierna, Otto; Persson, Anders; and Widell, Marja, to Asea Aktiebolag. Method and system for instantaneously determining the oxygen activity in molten metals. 4,105,507, Cl. 204-1.00T.

von Oertzen, Klaus; Bien, Hans Samuel, deceased (by Bien, Else, legal representative); and by Bien, Gabriele, legal representative, to Bayer Aktiengesellschaft. Antraquinone dyestuffs. 4,105,662, Cl. 544-294.000.

Vorbruggen, Helmut: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,105,792, Cl. 424-313.000.

Vyzkumny ustav bavlnarsky: *See*—
Mikulecky, Karel; Tyl, Miloslav; Janousek, Jan; Burysek, Frantisek; Skoda, Stanislav; and Esner, Stanislav, 4,104,854, Cl. 57-34.00R.

Vyzkumny ustav lykovych vlaken Superk: *See*—
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Waddey, Walter E.: *See*—
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Waddington & Duval (Holdings) Limited: *See*—
Lane, Charles Anthony; and Lucking, Anthony James, 4,105,141, Cl. 222-143.000.

Wadford, Thomas R. Door actuating system. 4,104,826, Cl. 49-360.000.

Wagner, Daniel William: *See*—
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Wagner Electric Corporation: *See*—
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Wagner, Eugene R.; and Matthews, Donald P., to Dow Chemical Company, The. Hypolipidemic cycloalkylaminobenzoic acids. 4,105,791, Cl. 424-310.000.

Wainio, Ronald A.: *See*—
Date, Kazuo H.; and Wainio, Ronald A., 4,105,878, Cl. 200-146.00R.

Waire, Aaron O.: *See*—
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Waku, Shigeru: *See*—
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Wakui, Yoko: *See*—
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Walker, Raymond P.: *See*—
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Walker, Richard J. Support device for pipe driller. 4,105,358, Cl. 408-108.000.

Wallace, Charles E.; and Farmer, Donald J., to Extek Microsystems, Inc. Vacuum head for film. 4,105,331, Cl. 355-103.000.

Wallace, Earl C.: *See*—
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Wallace Murray Corporation: *See*—
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Waller, John G. Container loading machine and process. 4,104,846, Cl. 53-26.000.

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Walter, Allen R.: *See*—
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Hughes, Clifford Ronald; Jackson, Stephen John; Preston, John; and Walton, Peter Leslie, 4,105,790, Cl. 424-309.000.

Wang, Richard H. S.; and Irick, Gether, Jr., to Eastman Kodak Company. Multichromophoric ultraviolet stabilizers and their use in organic compositions. 4,105,631, Cl. 260-45.80A.

Wang, Shing Chung; and Hamerdinger, Randolph W., to Xerox Corporation. Double-confined multiple anode hollow cathode laser. 4,105,954, Cl. 331-94.5PE.

Wang, Su-Sun: *See*—
Meienhofer, Johannes Arnold; and Wang, Su-Sun, 4,105,652, Cl. 260-112.50R.

Wang, Yen; and Chang, Wen-Hsuan, to Yen Wang. Surgical support. 4,105,025, Cl. 128-90.000.

Wankel GmbH: *See*—
Schindelhauer, Gerhard, 4,105,375, Cl. 418-54.000.

Wapelhorst, Friedrich-Wilhelm; and Kalkoff, Heinz-Dieter, to Trappe, Lieselotte. Method of vulcanizing a prevulcanized tread. 4,105,482, Cl. 156-96.000.

Ward Aero, Inc.: *See*—
Davitt, Joseph J., 4,105,044, Cl. 137-517.000.

Ward, Terence James, to John Wyeth & Brother Limited. Piperidine derivatives. 4,105,666, Cl. 260-293.770.

Ward, Terence James: *See*—
Archibald, John Leheup; and Ward, Terence James, 4,105,771, Cl. 424-267.000.

Warden, Lowell W.: *See*—
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Warren, David, to Lightning Fasteners Limited. Sliding clasp fastener. 4,104,767, Cl. 24-205.11R.

Wasco Products, Inc.: *See—*
Anghinetti, Joseph R.; and Couture, Paul A., 4,104,834, Cl. 52-1.000.
Wason, Satish K., to J. M. Huber Corporation. Amorphous precipitated siliceous pigments for cosmetic or dentifrice use and methods for their production. 4,105,757, Cl. 424-49.000.
Wasson, Joe R.; Pressley, Joseph R.; Baker, Robert W.; Fairaizl, Joseph H.; and Zorker, Richard J., to United States of America, Interior. Method of and apparatus for manipulating line weight in an image. 4,105,328, Cl. 355-78.000.
Watanabe, Tsutomu: *See—*
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Waters, Fred L. Floating wave powered pump. 4,105,368, Cl. 417-53.000.
Watson, James M., to Cosden Technology, Inc. Polymerization inhibitor for vinyl aromatic compounds. 4,105,506, Cl. 203-9.000.
Watt, Roy E.: *See—*
Brucken, Byron L.; and Watt, Roy E., 4,105,370, Cl. 417-222.000.
Watt, William R., to American Can Company. Photoinitiator free inks and method. 4,105,806, Cl. 427-44.000.
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Waylonis, John E.: *See—*
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Weatherholt, Brian R. Pool skimmer. 4,105,557, Cl. 210-169.000.
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Weemes, Doyle A.; and McConnell, Richard L., to Eastman Kodak Company. Peroxide treated substantially amorphous polyolefin/hydrocarbon rubber blends useful as pressure-sensitive adhesives. 4,105,718, Cl. 260-889.000.
Wehage, Charles H.: *See—*
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Wehle, Volker; and Reiffert, Jurgen, to Henkel Kommanditgesellschaft auf Aktien. Method and composition for inhibiting corrosion of metals in contact with water. 4,105,405, Cl. 21-2.70R.
Weibull, Torsten Waloddi. Door device in goods depots or the like. 4,104,836, Cl. 52-64.000.
Weidenaar, Bernard E., to Atlantic Richfield Company. Vapor sealing means for fuel dispensing nozzles. 4,105,054, Cl. 141-311.00R.
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Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, 4,105,874, Cl. 179-18.0AD.
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Wells, Thomas R.; and Kearney, Robert L., to Bell & Howell Company. Microfiche carrier. 4,105,319, Cl. 353-120.000.
Welz, Albert W., Jr.: *See—*
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Welz, Martin: *See—*
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Wernig, Fred E. Game of logic. 4,105,211, Cl. 273-237.000.
Wessel, Wolf; and Ripper, Wolfgang, to Robert Bosch GmbH. Fuel injection mechanism. 4,105,000, Cl. 123-139.0AW.
West, Edward L.; and Clutter, Melvin E., to A. B. Chance Company. High current grounding assembly having rigid interconnecting conductors. 4,105,272, Cl. 339-14.00L.
Westinghouse Electric Corp.: *See—*
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Culbertson, Charles H., 4,105,939, Cl. 318-599.000.
Dickinson, John D., 4,105,093, Cl. 184-6.110.
Evans, George S., 4,105,910, Cl. 313-490.000.
Fey, Maurice G., 4,105,888, Cl. 219-121.00P.
Fox, Richard Q.; Millholen, James I.; and McWhirter, John H., 4,106,097, Cl. 364-492.000.
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Whittingham, Thomas Anthony; and Farmery, Michael John, to National Research Development Corporation. Ultrasonic radiation balance. 4,104,923, Cl. 73-646.000.
Wick, Richard; Stemme, Otto; Lermann, Peter; and Schultheiss, Karl-Heinz, to AGFA-Gevaert AG. Accessory unit for photographic apparatus. 4,106,036, Cl. 354-83.000.
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Wiewiorowski, Tadeusz Karol; and Thornsberry, Willis Lee, Jr., to Freeport Minerals Company. Process for recovery of uranium from wet process phosphoric acid. 4,105,741, Cl. 423-10.000.
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Williams, Robert Franklin, Jr.; and Lu, Chen-i, to Eastman Kodak Company. Laminates useful as packaging materials and container having alkaline fluid means. 4,105,118, Cl. 206-524.200.
Williams, William D., to Sterling Drug, Inc. Self-venting spout. 4,105,148, Cl. 222-478.000.
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Wilson, Lional Agustin; Wales, John; and Plumtree, William Ernest George, to Xerox Corporation. Resilient arcuate surface containing photoconductor. 4,105,445, Cl. 96-1.50R.
Wilson, Robert A.; and Raden, David J., to Swift Agricultural Chemicals Corporation. Phosphoric acid manufacture from phosphate matrix. 4,105,749, Cl. 423-320.000.
Wilson, Ronald. Starter motors. 4,104,926, Cl. 74-6.000.
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Winston, Emanuel A. Bird feeder. 4,104,987, Cl. 119-51.00R.
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., to Firmenich & Cie. 2-Mercapto, alkyl, acetyl and furfuryl-sulfide pyrazines. 4,105,661, Cl. 544-405.000.
Winter, Roland A. E., to Ciba-Geigy Corporation. Epoxy resins flameproofed with 1,2-oxaphospholanes. 4,105,630, Cl. 260-45.80R.
Winter, Roland A. E., to Ciba-Geigy Corporation. α,β-Unsaturated schiff-base chain extension reactions for high temperature polymers. 4,105,646, Cl. 528-311.000.
Winters, Ted W.: *See—*
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Wojtowicz, John A., to Olin Corporation. Production of calcium hypochlorite compositions from quicklime and dichlorine monoxide. 4,105,565, Cl. 252-1.000.
Wolff, Friedrich. Reflector for use in sunlamps or the like. 4,106,083, Cl. 362-217.000.
Wolff, William F., to Standard Oil Company (Indiana). Dispersion of catalysts with explosives for in situ mining of carbonaceous minerals. 4,105,251, Cl. 299-2.000.
Wolfshagen, Ronald G.; Ypma, John E.; Murray, Glen W.; and Chen, Thomas T., to Rockwell International Corporation. Uniform rotating field network structure to efficiently package a magnetic bubble domain memory. 4,106,106, Cl. 365-2.000.
Wolkstein, Herbert J., to RCA Corporation. Frequency synthesizer with rapidly changeable frequency. 4,105,948, Cl. 331-14.000.
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Yamanaka, Ryoichi: *See—*
Tago, Atsuo; Yamanaka, Ryoichi; and Matsumoto, Susumu, 4,105,510, Cl. 203-14.000.
Yamanaka, Seisuke: *See—*
Nagumo, Fumio; and Yamanaka, Seisuke, 4,106,056, Cl. 358-50.000.
Yamano, Masaru; and Iemura, Toshio, to Sanyo Electric Co., Ltd. Core magnetron and method of manufacturing permanent magnets therefor with low gas emission. 4,105,913, Cl. 315-39.710.
Yamashita, Toshiharu, to Hoya Corporation. Filter glass. 4,105,577, Cl. 252-300.000.
Yamauchi, Teruo: *See—*
Hohsho, Yukio; Karino, Kimiji; Momono, Masakichi; Oyama, Yoshishige; Yamauchi, Teruo; and Teranishi, Takao, 4,105,720, Cl. 261-34.00A.
Yamazaki, Hiroshi; and Izawa, Minoru, to Kabushiki Kaisha Seikosha. Apparatus for generating an alarm sound. 4,104,862, Cl. 58-38.00R.
Yamazaki, Masahiro, to Nippon Zeon Co., Ltd. Method of embedding an end of a bundle of thread-like bodies in a molding material and controlling capillary action by said material. 4,105,731, Cl. 264-94.000.
Yamazaki, Takeo; Wakui, Yoko; and Kosugi, Tetuo, to Hitachi, Ltd. Chemical vapor deposition methods of depositing zinc boro-silicated glasses. 4,105,810, Cl. 427-248.00C.
Yan, Tsoung-Yuan: *See—*
Cushman, Donald Royal; Pagen, Charles Anthony; Schick, John William; and Yan, Tsoung-Yuan, 4,105,612, Cl. 260-27.0EV.
Yanke, David B.: *See—*
Martin, Donald L.; and Yanke, David B., 4,105,900, Cl. 307-219.000.
Yarbrough, Grover A., to Electronic Data Systems, Inc. Electrical usage display system. 4,106,095, Cl. 364-464.000.
Yasuda, Hiroshi; Tani, Katsuya; and Nagatamo, Jiro, to Toyo Boseki Kabushiki Kaisha. Process for the production of polyester fiber. 4,105,740, Cl. 264-290.00T.
Yasuda, Kazumasa: *See—*
Ishikawa, Takehiro; Yasuda, Kazumasa; Asano, Kazuhiro; and Ishijima, Takashi, 4,104,864, Cl. 58-39.500.
Yen, Shiao-Ping S.; Rembaum, Alan; and Molday, Robert S., to California Institute of Technology. Cell specific, variable density, polymer microspheres. 4,105,598, Cl. 521-53.000.
Yen Wang: *See—*
Wang, Yen; and Chang, Wen-Hsuan, 4,105,025, Cl. 128-90.000.
Yerkes, John W.; and Avery, James E., to Arco Solar, Inc. Solar cell with improved printed contact and method of making the same. 4,105,471, Cl. 136-89.0CC.
Yevick, George J., to Izon Corporation. Pinhole microfiche recorder and viewer. 4,105,318, Cl. 353-120.000.
Yoda, Kazuhiro; and Nakamura, Michiaki, to Kabushiki Kaisha Daini Seikosha. Electronic stop watch. 4,104,861, Cl. 58-38.00R.
Yokozawa, Norio: *See—*
Okada, Kunihiro; Itatsuda, Yoshiharu; Endoh, Takeyuki; Yabuuchi, Shigeru; and Yokozawa, Norio, 4,106,100, Cl. 364-702.000.
Yoo, Jin S.: *See—*
Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,105,416, Cl. 44-1.00R.
Yoscak, John L.: *See—*
Friedenberg, Robert M.; Yoscak, John L.; and Noren, Stephen E., 4,105,522, Cl. 204-195.00B.
Yoshida, Akihiko: *See—*
Nishino, Atsushi; Hayakawa, Hayashi; Yoshida, Akihiko; and Umeda, Junichiro, 4,105,513, Cl. 204-38.00A.
Yoshida, Masumi; Iwata, Kiyoshi; Yamamoto, Eiichiro; Masui, Takeshi; and Kabuyama, Yukikazu, to Fujitsu Limited. Pattern recognition processing system. 4,105,998, Cl. 340-146.3AC.
Yoshida, Muneo: *See—*
Ogawa, Shinsaku; and Yoshida, Muneo, 4,105,515, Cl. 204-98.000.
Yoshida, Sadao: *See—*
Kobayashi, Yasushi; Iwata, Minoru; Yoshida, Sadao; and Akatuka, Hisashi, 4,105,546, Cl. 210-11.000.
Yoshida, Takashi; Kosugi, Masao; and Matsuyama, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Field effect transistor having unsaturated characteristics. 4,106,044, Cl. 357-22.000.
Yoshida, Yoshiaki: *See—*
Miyazaki, Tsutomu; Yoshizawa, Toshio; Yoshida, Yoshiaki; Mitsuya, Kinpei; and Ogasawara, Takeshi, 4,105,165, Cl. 242-18.0PW.

Yoshioka, Yoshio: *See*—
Tsukushi, Masanori; Kashimura, Katsuichi; Hirasawa, Kunio; and Yoshioka, Yoshio, 4,105,879, Cl. 200-148.00A.

Yoshizawa, Toshio: *See*—
Miyazaki, Tsutomu; Yoshizawa, Toshio; Yoshida, Yoshiaki; Mitsuya, Kinpei; and Ogasawara, Takeshi, 4,105,165, Cl. 242-18.0PW.

Yosumi, Toshikazu: *See*—
Arai, Kazuo; Igarashi, Yoshiaki; Suzuki, Masaki; Sano, Nobuya; and Yosumi, Toshikazu, 4,105,935, Cl. 318-314.000.

Young, George Bartholomew. Fipple block for musical recorders. 4,104,948, Cl. 84-380.00C.

Young, James Arthur, Jr.: *See*—
Arnold, Hamilton Webster; Tillotson, LeRoy Conrad; and Young, James Arthur, Jr., 4,105,973, Cl. 325-4.000.

Young, Norman R.: *See*—
Baugh, Benjamin Charles; Young, Norman R.; and Runnion, Glenmore J., 4,105,096, Cl. 186-1.0AC.

Young Windows Inc.: *See*—
Hosmer, Stephen L., 4,104,825, Cl. 49-324.000.

Ypma, John E.: *See*—
Wolfshagen, Ronald G.; Ypma, John E.; Murray, Glen W.; and Chen, Thomas T., 4,106,106, Cl. 365-2.000.

Yu, Ruey J.; and Van Scott, Eugene J. Treatment of acne and dandruff. 4,105,782, Cl. 424-283.000.

Yu, Ruey J.; and Van Scott, Eugene J. Therapeutic treatment of dry skin. 4,105,783, Cl. 424-283.000.

Yuter, Seymour C.: *See*—
Margittai, Thomas, 4,104,805, Cl. 34-5.000.

Zachary, Richard E., to Dow Chemical Company, The. Leak detecting apparatus. 4,104,905, Cl. 73-40.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,105,658, Cl. 260-239.30T.

Zanella, Giuseppe; and Mancini, Luciano, to Montedison S.p.A. Process for preparing fibrils for use in the manufacture of paper. 4,105,727, Cl. 264-12.000.

Zeek, Richard M.: *See*—
Bell, Albert H., III; and Zeek, Richard M., 4,105,062, Cl. 165-9.000.

Zehender, Ernst: *See*—
Blaich, Bernhard; Zehender, Ernst; and Kerner, Karl, 4,105,821, Cl. 428-215.000.

Zeidler, Gunter; and Gunther, Christian, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Lubricating oil system. 4,105,092, Cl. 184-6.400.

Zenger, Alfred John: *See*—
Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,104,976, Cl. 112-121.110.

Zenith Radio Corporation: *See*—
Kesic, Branimir; and Pytlarz, Charles P., 4,105,989, Cl. 338-180.000.
Tzakis, George J., 4,106,054, Cl. 358-27.000.

Zhinzhikov, Pavel Andreevich: *See*—
Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.

Ziegler, Horst: *See*—
Caspar, Heinz; Kudritzki, Felix; and Ziegler, Horst, 4,104,924, Cl. 73-716.000.

Zimmermann, Heinz; and Martens, Wolfgang, to Hertel, Gunther; and Hertel, Karl Gustav. Processing roller having reinforcing jacket of hard metal. 4,105,264, Cl. 308-20.000.

Zimmermann, Rolf: *See*—
Jung, Albert; Hultzsch, Kurt; Zimmermann, Rolf; and Reese, Johannes, 4,105,610, Cl. 260-27.0BB.

Zimmermann, Werner Josef, to Windmoller & Holscher. Cooling apparatus for air cooling tubular plastics film made by a film blowhead. 4,105,380, Cl. 425-72.00R.

Zink, John S.: *See*—
Reed, Robert D.; Zink, John S.; and Schwartz, Robert E., 4,105,394, Cl. 431-202.000.

Zorker, Richard J.: *See*—
Wasson, Joe R.; Pressley, Joseph R.; Baker, Robert W.; Fairaizl, Joseph H.; and Zorker, Richard J., 4,105,328, Cl. 355-78.000.

Zotteri, Luciano: *See*—
Fortuna, Giorgio Della; and Zotteri, Luciano, 4,105,640, Cl. 528-292.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Agostini, Mario: *See*—
Ukmar, Luigi; Agostini, Mario; and Bellandi, Gianfranco, Re. 29,721, Cl. 222-105.000.

Armco Steel Corporation: *See*—
Byrd, Fred; Pierson, Marvin B.; Compton, Thomas A.; and Dunbar, Frank C., Re. 29,726, Cl. 427-320.000.

Bellandi, Gianfranco: *See*—
Ukmar, Luigi; Agostini, Mario; and Bellandi, Gianfranco, Re. 29,721, Cl. 222-105.000.

Byrd, Fred; Pierson, Marvin B.; Compton, Thomas A.; and Dunbar, Frank C., to Armco Steel Corporation. Method of coating carbon steel. Re. 29,726, Cl. 427-320.000.

Caterpillar Tractor Co.: *See*—
Haslett, Glenn M.; and Reinsma, Harold L., Re. 29,723, Cl. 305-57.000.

Cheetham, Ian: *See*—
Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.

Chokshi, Vibhas: *See*—
Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.

Compton, Thomas A.: *See*—
Byrd, Fred; Pierson, Marvin B.; Compton, Thomas A.; and Dunbar, Frank C., Re. 29,726, Cl. 427-320.000.

Dunbar, Frank C.: *See*—
Byrd, Fred, Pierson, Marvin B.; Compton, Thomas A.; and Dunbar, Frank C., Re. 29,726, Cl. 427-320.000.

Dunkerley, Kenneth: *See*—
Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.

Du Pont de Nemours, E. I., and Company: *See*—
Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., Re. 29,725, Cl. 23-230.00R.

Eckersley, Dennis: *See*—
Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.

Fujita, Kinji, to Kabushiki Kaisha Suwa Seikosha. Time correcting apparatus for an electronic timepiece. Re. 29,720, Cl. 58-23.00R.

Fujita, Kinji, to Kabushiki Kaisha Suwa Seikosha. Digital display device. Re. 29,727, Cl. 340-336.000.

General Signal Corporation: *See*—
McEathron, Eugene Douglas, Re. 29,722, Cl. 303-37.000.

Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, to Imperial Chemical Industries Limited. Dyeing process. Re. 29,724, Cl. 8-39.00B.

Haslett, Glenn M.; and Reinsma, Harold L., to Caterpillar Tractor Co. Resilient mid-pitch lug for an endless track. Re. 29,723, Cl. 305-57.000.

Imperial Chemical Industries Limited: *See*—
Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.

Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., to Du Pont de Nemours, E. I., and Company. Analytical test pack and process for analysis. Re. 29,725, Cl. 23-230.00R.

Kabushiki Kaisha Suwa Seikosha: *See*—
Fujita, Kinji, Re. 29,720, Cl. 58-23.00R.
Fujita, Kinji, Re. 29,727, Cl. 340-336.000.

McEathron, Eugene Douglas, to General Signal Corporation. Fluid brake control system. Re. 29,722, Cl. 303-37.000.

Montedison S.p.A.: *See*—
Ukmar, Luigi; Agostini, Mario; and Bellandi, Gianfranco, Re. 29,721, Cl. 222-105.000.

Nadeau, Richard G.: *See*—
Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., Re. 29,725, Cl. 23-230.00R.

Newton, David Francis: *See*—
Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.

Nieuweboer, Gerrit: *See*—
Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., Re. 29,725, Cl. 23-230.00R.

Phillips, Duncan Adrian Sidney: *See*—
Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.

Pierson, Marvin B.: *See*—
Byrd, Fred; Pierson, Marvin B.; Compton, Thomas A.; and Dunbar, Frank C., Re. 29,726, Cl. 427-320.000.

Reinsma, Harold L.: *See*—
Haslett, Glenn M.; and Reinsma, Harold L., Re. 29,723, Cl. 305-57.000.

Truett, William L.: *See*—
Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., Re. 29,725, Cl. 23-230.00R.

Ukmar, Luigi; Agostini, Mario; and Bellandi, Gianfranco, to Montedison S.p.A. Plastic bag and a protective container therefor and a fixture for securing the bag in the container. Re. 29,721, Cl. 222-105.000.

Williams, Gerald: *See*—
Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.

LIST OF PLANT PATENTEES

Pan-American Plant Company: *See*—
Shoesmith, Leonard H., 4,289, Cl. 76.000.
Shoeamith, Leonard H., 4,290, Cl. 78.000.

Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum plant named Loyalty. 4,289, 8-8-78, Cl. 76.000.

Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum named British Gold. 4,290, 8-8-78, Cl. 78.000.

LIST OF DESIGN PATENTEES

Adams, Donald Gilbert. Portable high chair. 248,799, 8-8-78, Cl. D6-9.000.

Aesch, Harold, Jr.: *See*—
Aesch, Harold, Sr.; Aesch, Harold, Jr.; and Welch, Darrell N., 248,840, Cl. D10-107.000.

Aesch, Harold, Sr.; Aesch, Harold, Jr.; and Welch, Darrell N., to Aesch, Harold W., Sr.; Aesch, Harold W., Jr.; Welch, Darrell N.; Saha, Asis K.; and Pollet, John B., part interest to each. Buoy. 248,840, 8-8-78, Cl. D10-107.000.

Aesch, Harold W., Jr.: *See*—
Aesch, Harold, Sr.; Aesch, Harold, Jr.; and Welch, Darrell N., 248,840, Cl. D10-107.000.

Aesch, Harold W., Sr.: *See*—
Aesch, Harold, Sr.; Aesch, Harold, Jr.; and Welch, Darrell N., 248,840, Cl. D10-107.000.

Aladdin Industries, Incorporated: *See*—
Bridges, John A., 248,805, Cl. D6-136.000.
Bridges, John A., 248,806, Cl. D6-136.000.

American Optical Corporation: *See*—
Johnsen, David W., 248,861, Cl. D16-65.000.

American Thermometer Co., Inc.: *See*—
Hutten, James E., 248,837, Cl. D10-57.000.

Anderson, Charles F.: *See*—
Canfield, Vernon C.; and Anderson, Charles F., 248,807, Cl. D6-157.000.

Anderson, Victor F., to Shell Oil Company. Jug. 248,829, 8-8-78, Cl. D9-44.000.

Anderson, Victor F., to Shell Oil Company. Jug. 248,830, 8-8-78, Cl. D9-52.000.

Anderson, Victor F., to Shell Oil Company. Jug. 248,831, 8-8-78, Cl. D9-52.000.

Anderson, Victor F., to Shell Oil Company. Bottle. 248,836, 8-8-78, Cl. D9-167.000.

Andersson, Bengt. Paper press for waste. 248,857, 8-8-78, Cl. D15-123.000.

Andrews, Francis: *See*—
Sussman, Philip; and Andrews, Francis, 248,865, Cl. D19-43.000.

Asaki, James T., to International Telephone & Telegraph Corporation. C. B. Radio. 248,855, 8-8-78, Cl. D14-75.000.

Asaki, James T., to International Telephone & Telegraph Corporation. Photoflash attachment for cameras. 248,859, 8-8-78, Cl. D16-42.000.

Ball Corporation: *See*—
Campbell, William B., 248,843, Cl. D11-127.000.
Campbell, William B., 248,844, Cl. D11-128.000.

Bayly, Peter Kingsley, to Wiltshire Cutlery Company Proprietary Ltd. Nut cracker. 248,814, 8-8-78, Cl. D7-98.000.

Beecham, Inc.: *See*—
Goldschmidt, Willfred; and Kittrell, Wiley Alan, 248,827, Cl. D9-2.000.

Benkoe, Elisabeth, executrix: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.

Benkoe, Erwin, deceased: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.

Berg, Albert T., Jr.; and Langlie, Howard. Electric fence extender for wooden posts. 248,850, 8-8-78, Cl. D13-17.000.

Berg, Albert T., Jr.: *See*—
Langlie, Howard; and Berg, Albert T., Jr., 248,851, Cl. D13-18.000.

Bergquist, Brice E.: *See*—
White, Robert E.; and Bergquist, Brice E., 248,845, Cl. D12-25.000.

Bliven, Albert B.: *See*—
Stage, James C.; Bliven, Albert B.; and Wohlhueter, James E., 248,846, Cl. D12-156.000.

Bridges, John A., to Aladdin Industries, Incorporated. Wall mounted modular tray. 248,805, 8-8-78, Cl. D6-136.000.

Bridges, John A., to Aladdin Industries, Incorporated. Wall mounted modular tray. 248,806, 8-8-78, Cl. D6-136.000.

Brookes, Malcolm J.: *See*—
Spranger, Douglas M.; Brookes, Malcolm J.; and Schmidt, Peter O., 248,860, Cl. D16-62.000.

Budd, James M. Cut tree holder. 248,804, 8-8-78, Cl. D6-105.000.

Burke, Jacob Benjamin: *See*—
Rosen, Ziva Grushevsky; and Burke, Jacob Benjamin, 248,882, Cl. D34-5.0MM.

Campbell, William B., to Ball Corporation. Christmas ornament. 248,843, 8-8-78, Cl. D11-127.000.

Campbell, William B., to Ball Corporation. Christmas ornament. 248,844, 8-8-78, Cl. D11-128.000.

Canfield, Vernon C.; and Anderson, Charles F. Multiple station service counter. 248,807, 8-8-78, Cl. D6-157.000.

Chesley, Ronald F.: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.

Chicago Pneumatic Tool Company: *See*—
Roth, Robert D.; and Schaedler, Raymond J., 248,820, Cl. D8-61.000.

Christer Odvik AB: *See*—
Forsman, Tore Alexander; and Odvik, Christer, 248,871, Cl. D24-31.000.

Comensoli, Leo; and Smythe, Gloria Dawn, to Speedo Knitting Mills Pty Ltd. Fabric. 248,893, 8-8-78, Cl. D92-1.00K.

Concord Laboratories: *See*—
Raitto, Russell G., 248,873, Cl. D24-99.000.

Conwed Corporation: *See*—
Eckerline, Austin, 248,823, Cl. D8-382.000.

Crawford, Ralph W.: *See*—
Spengler, Duane E.; and Crawford, Ralph W., 248,889, Cl. D34-15.0LL.

Dacey, Norman F. Fire grate. 248,818, 8-8-78, Cl. D7-207.000.

Day, Ronald Henry, to Hille International Limited. Chair shell. 248,810, 8-8-78, Cl. D6-197.000.

Ditto, Donald R. Spreading tree plaque. 248,842, 8-8-78, Cl. D11-118.000.

Driscoll, James R. Table. 248,798, 8-8-78, Cl. D6-177.000.

Dunhill Lighters Limited: *See*—
Harris, Anthony Roberts, 248,877, Cl. D27-36.000.

Eckerline, Austin, to Conwed Corporation. Room divider connector or similar device. 248,823, 8-8-78, Cl. D8-382.000.

Eiserman, John H. Double ended vacuum bottle. 248,812, 8-8-78, Cl. D7-77.000.

Estate of Erwin Benkoe: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.

Everitt, Delmar K.: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.

F & B Manufacturing, Inc.: *See*—
Poe, H. Gerald, 248,821, Cl. D8-107.000.

Famolare, Inc.: *See*—
Famolare, Joseph P., Jr., 248,796, Cl. D2-322.000.

Famolare, Joseph P., Jr., to Famolare, Inc. Shoe sole. 248,796, 8-8-78, Cl. D2-322.000.

FBK Industries, Inc.: *See*—
Korsmeyer, Fred B., 248,835, Cl. D9-159.000.

Fiat Motors of North America: *See*—
Kozloski, Edward A., 248,849, Cl. D12-209.000.

Forsman, Tore Alexander; and Odvik, Christer, to Toringe Consult AB; and Christer Odvik AB. Surgical instrument tray. 248,871, 8-8-78, Cl. D24-31.000.

Foxworthy, Theodore David. Game board. 248,884, 8-8-78, Cl. D34-5.0SS.

Fratelli Saporiti: *See*—
Offredi, Giovanni, 248,808, Cl. D6-169.000.

Frick, William G. Surface mount indicia display apparatus. 248,895, 8-8-78, Cl. D96-12.00R.

Friedrich, Richard D.: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.

Fuji Photo Film Co., Ltd.: *See*—
Fukuda, Hiroshi, 248,858, Cl. D16-06.000.

Fukuda, Hiroshi, to Fuji Photo Film Co., Ltd. Camera. 248,858, 8-8-78, Cl. D16-06.000.

Futami, Victor K. Retractable shoe cleaner. 248,816, 8-8-78, Cl. D7-182.000.

Gemco-Ware Inc.: *See*—
Schlessel, Walter, 248,811, Cl. D7-53.000.

Goldfarb, Adolph: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.

Goldfarb, Adolph E.; Benkoe, Erwin, deceased (Benkoe, Elisabeth, executrix); Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., to Goldfarb, Adolph; and Estate of Erwin Benkoe. Toy figure. 248,881, 8-8-78, Cl. D34-4.00R.

Goldschmidt, Willfred; and Kittrell, Wiley Alan, to Beecham, Inc. Combined bottle and breakaway closure. 248,827, 8-8-78, Cl. D9-2.000.

Gonzales, Rafael L. Leg holster. 248,866, 8-8-78, Cl. D22-13.000.

Gremlin Industries, Inc.: *See*—
Pogue, Lonnie C., 248,885, Cl. D34-5.00L.

Halm, Hans. Razor. 248,878, 8-8-78, Cl. D28-46.000.

Hamasaki, Yoshihiro: *See*—
Taitani, Hirotsune; and Hamasaki, Yoshihiro, 248,848, Cl. D12-209.000.

Hare, Kenneth H. Contour hoe. 248,819, 8-8-78, Cl. D8-11.000.

Harris, Anthony Roberts, to Dunhill Lighters Limited. Lighter. 248,877, 8-8-78, Cl. D27-36.000.

Hass, Martin A. Dental locator for positioning denture. 248,870, 8-8-78, Cl. D24-10.000.

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Spranger, Douglas M.; Brookes, Malcolm J.; and Schmidt, Peter O., 248,860, Cl. D16-62.000.
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Sato, Katsumi, 248,888, Cl. D34-15.00K.
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Williams, William O., Jr. Artificial fishing lure. 248,867, 8-8-78, Cl. D22-27.000.

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CLASSIFICATION OF PATENTS

ISSUED AUGUST 8, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

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517 4,105,044
563 4,105,045
594 4,105,046
625.6 4,105,047

CLASS 138

42 4,105,048
44 4,105,049
45 4,105,050
162 4,105,051

CLASS 139

101 4,105,052
435 4,105,053

CLASS 141

311 R 4,105,054

CLASS 144

286 R 4,105,055

CLASS 145

50 A 4,105,056

CLASS 148

1.5 4,105,472
6 4,105,473
12 F 4,105,474
175 4,105,475
187 4,105,476
4,105,477
188 4,105,478
189 4,105,479

CLASS 149

40 4,105,480

CLASS 150

35 4,105,057

CLASS 151

41.74 4,105,058

CLASS 156

79 4,105,481
96 4,105,482
154 4,105,483
380 4,105,484
382 4,105,485
405 R 4,105,486
4,105,487
425 4,105,488
510 4,105,489
526 4,105,490
553 4,105,491
629 4,105,492
644 4,105,493

CLASS 162

19 4,105,494
348 4,105,495

CLASS 164

4 4,105,059
130 4,105,060

CLASS 165

1 4,105,061
9 4,105,062
21 4,105,063
29 4,105,064
78 4,105,065
94 4,105,066
159 4,105,067

CLASS 166

51 4,105,069
250 4,105,070
4,105,071
261 4,105,072
286 4,105,073
317 4,105,074
321 4,105,075
355 4,105,068

CLASS 169

40 4,105,076

CLASS 172

311 4,105,077
781 4,105,078

CLASS 173

42 4,105,079
66 4,105,080

CLASS 174

14 R 4,105,859
15 C 4,105,860
52 FP 4,105,861
53 4,105,862

CLASS 175

122 4,105,081
302 4,105,082
313 4,105,083

CLASS 176

19 R 4,105,496

CLASS 178

67 4,105,863

CLASS 179

1 G 4,105,865
1 J 4,105,864
6 R 4,105,866
6.3 R 4,105,867
15 BD 4,105,869
15 BT 4,105,868
15.55 R 4,105,870
18 AD 4,105,871
4,105,872
4,105,873
4,105,874
4,105,876
18 GF 4,105,875
111 R 4,105,877

CLASS 180

11 4,105,084
43 R 4,105,085
79 4,105,086
89.15 4,105,087
108 4,105,088

CLASS 181

264 4,105,089
265 4,105,090

CLASS 182

181 4,105,091

CLASS 184

6.11 4,105,093
6.4 4,105,092
7 F 4,105,094
55 A 4,105,095

CLASS 186

1 AC 4,105,096

CLASS 187

8.75 4,105,097

CLASS 188

1 B 4,105,098

CLASS 191

29 DM 4,105,099

CLASS 192

4 A 4,105,101
034 4,105,100
106.1 4,105,102

CLASS 193

32 4,105,103

CLASS 194

57 4,105,104
100 A 4,105,105

CLASS 195

59 4,105,498
103.5 M 4,105,500
103.5 R 4,105,499

CLASS 198

358 4,105,107
402 4,105,108
499 4,105,109
731 4,105,110
844 4,105,111

CLASS 200

52 R 4,105,885
61.17 4,106,004
146 R 4,105,878
148 A 4,105,879
4,105,880
148 B 4,105,881
157 4,105,882
296 4,105,883
331 4,105,884

CLASS 201

6 4,105,501
12 4,105,502
40 4,105,503

CLASS 202

91 4,105,504
173 4,105,505

CLASS 203

9 4,105,506
14 4,105,510

CLASS 204

1 T 4,105,507
4,105,508
4,105,509
38 A 4,105,511
4,105,512
4,105,513
98 4,105,514
4,105,515
4,105,516
157.1 R 4,105,517
159.14 4,105,518
159.23 4,105,519
162 R 4,105,520
180 S 4,105,521
195 B 4,105,522
4,105,523
195 P 4,105,525
195 S 4,105,524
213 4,105,526
228 4,105,527
237 4,105,528
267 4,105,529
290 R 4,105,530
4,105,531
301 4,105,532
4,105,533
4,105,534

CLASS 206

1.5 4,105,112
100 4,105,113
219 4,105,114
370 4,105,115
484 4,105,116
501 4,105,117
524.2 4,105,118
579 4,105,119
581 4,105,120
592 4,105,121

CLASS 208

8 4,105,535
11 LE 4,105,537
11 R 4,105,536
18 4,105,538
33 4,105,539
48 AA 4,105,540
111 4,105,541
180 4,105,542

CLASS 209

73 4,105,122
111.6 4,105,123
114 4,105,124
240 4,105,543
317 4,105,544

CLASS 210

11 4,105,546
15 4,105,545
22 R 4,105,547
23 H 4,105,548
33 4,105,549
50 4,105,550
58 4,105,551
64 4,105,552
73 W 4,105,553
96 R 4,105,554
136 4,105,555
152 4,105,556
169 4,105,557
199 4,105,558
225 4,105,559
230 4,105,560
232 4,105,561
4,105,562
383 4,105,563
497 R 4,105,564

CLASS 211

13 4,105,125
49 D 4,105,126
124 4,105,127

CLASS 213

61 4,105,128

CLASS 214

152 4,105,129
314 4,105,130
315 4,105,131

CLASS 215

216 4,105,132

CLASS 219

10.55 E 4,105,886
72 4,105,887
121 EB 4,105,890
121 LM 4,105,889
121 P 4,105,888
137.43 4,105,891
216 4,105,892
316 4,105,893
326 4,105,895
365 4,105,894
470 4,105,896

CLASS 220

266 4,105,133
268 4,105,134
288 4,105,135
339 4,105,136

CLASS 222

1 4,105,137
14 4,105,138
105 Re.29,721
4,105,139
131 4,105,140
143 4,105,141
158 4,105,142
161 4,105,143
187 4,105,144
340 4,105,145
383 4,105,146
413 4,105,147
478 4,105,148

CLASS 225

25 4,105,149
96.5 4,105,150

CLASS 228

170 4,105,151

CLASS 229

23 BT 4,105,152
23 R 4,105,153
27 4,105,154
33 4,105,155

CLASS 235

92 SB 4,105,914
441 4,105,156
475 4,105,157

CLASS 237

12.3 C 4,105,158

CLASS 238

36 4,105,159
167 4,105,160

CLASS 239

2 S 4,105,161
109 4,105,162
406 4,105,163
526 4,105,164

CLASS 242

18 PW 4,105,165
45 4,105,166
54 R 4,105,167
55.2 4,105,168
56 R 4,105,169
65 4,105,170
68.4 4,105,171
78.1 4,105,172

CLASS 244

3.16 4,105,174
146 4,105,173

CLASS 246

430 4,105,175

CLASS 248

13 4,105,176
15 4,105,177
151 4,105,178
221.2 4,105,179
300 4,105,180
452 4,105,181
459 4,105,182
484 4,105,183

CLASS 249

79 4,105,184
194 4,105,185

CLASS 250

199 4,105,915
282 4,105,916
291 4,105,917
337 4,105,918
341 4,105,919
402 4,105,920
423 P 4,105,921
456 4,105,923
492 A 4,105,924
495 T 4,105,922
561 4,105,925
566 4,105,926

CLASS 251

35 4,105,186
334 4,105,187

CLASS 252

1 4,105,565
8.1 4,105,566
8.55 D 4,105,570
8.6 4,105,567
4,105,568
4,105,569
32.7 E 4,105,571
62.1 P 4,105,572
99 4,105,573
154 4,105,574
182 4,105,575
190 4,105,576
300 4,105,577
316 4,105,578
317 4,105,579
351 4,105,580
389 A 4,105,581
392 4,105,582
408 4,105,583
426 4,105,584
429 B 4,105,585
437 4,105,586
439 4,105,587
454 4,105,588
462 4,105,589
464 4,105,590
466 J 4,105,591
545 4,105,592

CLASS 254

10.5 4,105,188
139 4,105,189

CLASS 256

1 4,105,190

CLASS 260

2.3 4,105,593
8 4,105,602
4,105,603
17.2 4,105,604
17.4 GC 4,105,605
17.5 4,105,606
22 CB 4,105,607
23 H 4,105,609
23 R 4,105,608
27 BB 4,105,610
27 EV 4,105,611
4,105,612
29.4 R 4,105,613
4,105,614
29.6 T 4,105,615
31.2 N 4,105,617
33.6 PQ 4,105,619
33.6 UA 4,105,618
37 N 4,105,620
4,105,621
4,105,622
38 4,105,623
40 R 4,105,624
45.75 D 4,105,632
45.8 A 4,105,631
45.8 N 4,105,625
4,105,627
45.8 NT 4,105,629
45.8 NZ 4,105,626
45.8 R 4,105,630
45.85 R 4,105,628
112 B 4,105,650
112.5 R 4,105,651
4,105,652
158 4,105,653
205 4,105,654
207.1 4,105,655
239 B 4,105,657
239.3 T 4,105,658
239.55 C 4,105,660
239.9 4,105,656
289 C 4,105,665
293.54 4,105,659
293.77 4,105,666
299 4,105,667
306.7 R 4,105,668
307 F 4,105,669
326.11 R 4,105,670
326.43 4,105,671
340.2 4,105,672
343 4,105,673
343.6 4,105,674
345.2 4,105,675
345.9 S 4,105,676
346.11 4,105,677
4,105,678
4,105,679
378 4,105,680
404 4,105,681
408 4,105,682
429.1 4,105,683
429.7 4,105,684
448.2 N 4,105,685
453 PH 4,105,686
465.4 4,105,687
465.8 R 4,105,688
502.5 4,105,689
519 4,105,690
530 R 4,105,691
543 R 4,105,692
558 P 4,105,693
561 H 4,105,694
570.8 R 4,105,695
586 F 4,105,696
601 R 4,105,697
650 R 4,105,701
658 R 4,105,702
665 G 4,105,703
666 P 4,105,704
668 R 4,105,705
668 A 4,105,706
683.48 4,105,707
849 4,105,708
857 L 4,105,709
869 4,105,710
873 4,105,711
4,105,712
879 4,105,713
4,105,714
881 4,105,715
884 4,105,716
889 4,105,717
4,105,718

CLASS 261

34 A 4,105,720
34 B 4,105,719
76 4,105,721
94 4,105,722
105 4,105,723
112 4,105,724
121 B 4,105,726
122 4,105,725

CLASS 264

12 4,105,727
40.7 4,105,728
71 4,105,729
89 4,105,730
94 4,105,731
104 4,105,732
108 4,105,733
132 4,105,734
143 4,105,735
153 4,105,736
154 4,105,737
163 4,105,738
256 4,105,739
290 T 4,105,740

CLASS 266

88 4,105,191
149 4,105,192

CLASS 267

64 R 4,105,193
4,105,194
131 4,105,195

CLASS 270

58 4,105,196
68 R 4,105,197

CLASS 271

14 4,105,198
122 4,105,199

CLASS 272

67 4,105,200
111 4,105,201

CLASS 273

29 A 4,105,203
4,105,204
73 J 4,105,205
85 R 4,105,206
89 4,105,207
95 R 4,105,208
106.5 R 4,105,209
126 R 4,105,210
237 4,105,211
309 4,105,202

CLASS 274

38 4,105,212
4,105,213

CLASS 277

74 4,105,214
116.2 4,105,215

CLASS 280

6 R 4,105,216
28 4,105,217
43.12 4,105,218
65 R 4,105,245
289 E 4,105,220
461 A 4,105,221
668 4,105,222
752 4,105,223
789 4,105,219

CLASS 281

15 R 4,105,224

CLASS 282

27.5 4,105,225

CLASS 285

175 4,105,226
412 4,105,227

CLASS 289

2 4,105,228

CLASS 292

113 4,105,229
202 4,105,230
264 4,105,231
288 4,105,232
4,105,233
302 4,105,234
341.18 4,105,235

CLASS 293

71 R 4,105,236
73 4,105,237

CLASS 294

11 4,105,238
65.5 4,105,239
81 R 4,105,240
86 R 4,105,241

CLASS 296

20 4,105,242
28 R 4,105,243

84 H 4,105,248
97 E 4,105,246

CLASS 297

45 4,105,244
149 4,105,247
230 4,105,249
445 4,105,250

CLASS 299

2 4,105,251
4 4,105,252
4,105,253

CLASS 301

63 DS 4,105,254
97 4,105,255

CLASS 302

51 4,105,256

CLASS 303

15 4,105,257
37 Re.29,722
93 4,105,258

CLASS 305

50 4,105,259
54 4,105,260
57 Re.29,723

CLASS 307

3 4,105,897
10 LS 4,105,898
115 4,105,899
219 4,105,900
273 4,105,901
308 4,105,902
328 4,105,903

CLASS 308

4 A 4,105,262
8.2 4,105,263
20 4,105,264
72 4,105,261
158 4,105,265
237 R 4,105,266
240 4,105,267

CLASS 310

27 4,105,904
59 4,105,905
87 4,105,906
232 4,105,907

CLASS 312

184 4,105,268
248 4,105,269
253 4,105,271
330 R 4,105,270

CLASS 313

217 4,105,908
473 4,105,909
490 4,105,910

CLASS 315

3.5 4,105,911
10 4,105,912
39.71 4,105,913
82 4,105,927
4,105,928
125 4,105,929
169 TV 4,105,930
278 4,105,931
377 4,105,932
387 4,105,933

CLASS 318

7 4,105,934
314 4,105,935
328 4,105,936
568 4,105,937
599 4,105,938
4,105,939
653 4,105,940
676 4,105,961

CLASS 320

32 4,105,962

CLASS 322

48 4,105,963

CLASS 323

43.5 S 4,105,964

CLASS 324

28 CB 4,105,965
113 4,105,966
115 4,105,967
133 4,105,968
151 R 4,105,969
158 P 4,105,970
203 4,105,971
220 4,105,972

CLASS 325

4 4,105,973
21 4,105,974
320 4,105,975
404 4,105,976
472 4,105,977

CLASS 328

58 4,105,978
164 4,105,979
165 4,105,980

CLASS 329

50 4,105,981

CLASS 330

124 R 4,105,941
261 4,105,942
290 4,105,943
4,105,944
294 4,105,945

CLASS 331

1 A 4,105,946
4,105,947
14 4,105,948
37 4,105,949
57 4,105,950
90 4,105,951
94.5 H 4,105,955
94.5 PE 4,105,952
4,105,954
94.5 Q 4,105,953
4,105,956
110 4,105,957

CLASS 333

29 4,105,958
31 R 4,105,959
81 A 4,105,960

CLASS 335

151 4,105,982
212 4,105,983

CLASS 336

60 4,105,984
90 4,105,985

CLASS 337

3 4,105,986

CLASS 338

130 4,105,987
132 4,105,988
180 4,105,989

CLASS 339

14 L 4,105,272
47 R 4,105,273
75 P 4,105,274
91 R 4,105,275
95 D 4,105,276
95 R 4,105,277
103 M 4,105,278
117 R 4,105,279
273 S 4,105,280

CLASS 340

3 D 4,105,991
3 R 4,105,990
15 4,105,992
15.5 CP 4,105,993
27 R 4,106,013
71 4,105,994
73 4,105,996
146.1 AL 4,105,999
146.1 E 4,105,995
146.3 AC 4,105,998
146.3 ED 4,105,997
310 A 4,106,007
324 AD 4,106,008
336 Re.29,727
343 4,106,009
347 AD 4,106,010
365 E 4,106,011
523 4,106,012
530 4,106,000
4,136,003
543 4,106,006
604 4,106,001
626 4,106,002
676 4,106,005

CLASS 343

5 SA 4,106,014
5 SC 4,106,021
5 W 4,106,015
7.4 4,106,016
8 4,106,017
9 4,106,019
12 A 4,106,018
14 4,106,020
105 R 4,106,022
106 D 4,106,023
715 4,106,024
4,106,025
786 4,106,026

CLASS 346

1 4,106,027
74.1 4,106,028
117 A 4,106,029
140 R 4,106,030
4,106,031
4,106,032

CLASS 350

6.5 4,105,281
10 4,105,282
96.21 4,105,285
96.31 4,105,283
96.33 4,105,284
99 4,105,286
113 4,105,287
162 SF 4,105,289
168 4,105,290
184 4,105,291
189 4,105,308
211 4,105,292
264 4,105,293
269 4,105,294
289 4,105,301
303 4,105,295
307 4,105,296
336 4,105,297
340 4,105,298
349 4,105,299
350 4,105,288

CLASS 351

7 4,105,302
39 4,105,303
47 4,105,304
111 4,105,305

CLASS 352

14 4,105,306
72 4,105,307
130 4,105,309
171 4,105,310
187 4,105,311

CLASS 353

27 R 4,105,312
65 4,105,313
85 4,105,314
95 4,105,315
109 4,105,316
117 4,105,317
120 4,105,318
4,105,319

CLASS 354

23 D 4,106,033
31 4,106,034
51 4,106,035
83 4,106,036
128 4,106,037
155 4,106,038
193 4,106,039
205 4,106,040
206 4,106,041
317 4,106,042

CLASS 355

3 CH 4,105,321
3 TR 4,105,320
4 4,105,322
9 4,105,323
14 4,105,324
54 4,105,325
55 4,105,326
59 4,105,327
78 4,105,328
91 4,105,329
102 4,105,330
103 4,105,331

CLASS 356

5 4,105,332
85 4,105,333
104 4,105,334
108 4,105,335
113 4,105,336
114 4,105,337
118 4,105,338
152 4,105,339
168 4,105,340
225 4,105,300

CLASS 357

13 4,106,043
22 4,106,044
23 4,106,045
30 4,106,046
4,106,047
40 4,106,048
46 4,106,049
49 4,106,050
71 4,106,051
72 4,106,052

CLASS 358

13 4,106,053
27 4,106,054
4,106,055
50 4,106,056
128 4,106,057
4,106,058
191 4,106,059
256 4,106,060
296 4,106,061

CLASS 360

15 4,106,062
38 4,106,063
60 4,106,064
109 4,106,065
133 4,106,066
137 4,106,067

CLASS 361

15 4,106,068
30 4,106,069
42 4,106,070
79 4,106,071
156 4,106,072
248 4,106,073
4,106,074
320 4,106,075
394 4,106,076

CLASS 362

8 4,106,077
18 4,106,080
32 4,106,078
34 4,106,079
61 4,106,081
87 4,106,082
217 4,106,083

CLASS 363

21 4,106,084
51 4,106,085
60 4,106,086
70 4,106,087
132 4,106,088
153 4,106,089

CLASS 364

200 4,106,090
4,106,091
4,106,092
4,106,093
424 4,106,094
453 4,106,095
464 4,106,096
481 4,106,097
492 4,106,098
500 4,106,099
510 4,106,100
702 4,106,101
709 4,106,102
724 4,106,103
827 4,106,104
900 4,106,105

CLASS 365

2 4,106,106
191 4,106,107
222 4,106,108
238 4,106,109

CLASS 366

2 4,106,110
3 4,106,111
4 4,106,112
79 4,106,113
131 4,106,114
138 4,106,115
144 4,106,116
154 4,106,117
185 4,106,118

CLASS 400

144.2 4,105,341
556.2 4,105,106

CLASS 401

15 4,105,342

CLASS 403

4,105,343
24 4,105,344
4,105,345
104 4,105,346
157 4,105,347
172 4,105,348
209 4,105,349
220 4,105,350
312 4,105,351
402 4,105,352

CLASS 404

2 4,105,353
72 4,105,354
114 4,105,355
117 4,105,356

CLASS 407

41 4,105,357

CLASS 408

108 4,105,358
112 4,105,359
118 4,105,360
130 4,105,361

CLASS 415

2 4,105,362

CLASS 416

41 4,105,363
97 R 4,105,364
107 4,105,365
132 A 4,105,366

CLASS 417

36 4,105,367
53 4,105,368
206 4,105,369
222 4,105,370
238 4,105,371
243 4,105,372
317 4,105,373
415 4,105,374

CLASS 418

54 4,105,375
77 4,105,376
173 4,105,377
195 4,105,378

CLASS 423

10 4,105,741
22 4,105,742
24 4,105,743
239 4,105,744
4,105,745
251 4,105,746
263 4,105,747
320 4,105,748
4,105,749
456 4,105,750
478 4,105,751
496 4,105,752
502 4,105,753
514 4,105,754
648 R 4,105,755

CLASS 424

48 4,105,756
49 4,105,757
4,105,758
52 4,105,759
78 4,105,779
180 4,105,760
243 4,105,761
245 4,105,762
246 4,105,763
248.54 4,105,764
248.56 4,105,765
251 4,105,766
256 4,105,767
263 4,105,768
4,105,769
4,105,770
267 4,105,771
269 4,105,772
270 4,105,773
273 R 4,105,774
4,105,775
274 4,105,776
4,105,777
275 4,105,778
282 4,105,780
283 4,105,781
4,105,782
4,105,783
4,105,784
285 4,105,785
303 4,105,786
309 4,105,787
4,105,788
4,105,789
4,105,790
310 4,105,791
313 4,105,792
314 4,105,793
317 4,105,794
320 4,105,795
330 4,105,796
4,105,797
352 4,105,798

CLASS 425

47 4,105,379
72 R 4,105,380
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324 4,105,851
342 4,105,852

CLASS 560

24 4,105,853
55 4,105,854
190 4,105,855
191 4,105,856
222 4,105,858

CLASS 568

726 4,105,857
744 4,105,698
4,105,699
875 4,105,700

CLASSIFICATION OF DESIGNS

D2—	322	248,796		88	248,813		52	248,830		191	248,847			248,864		3	248,880
	400	248,797		98	248,814			248,831		209	248,848		43	248,865	D34—	4 R	248,881
D6—	9	248,799		129	248,815		60	248,832			248,849	D22—	13	248,866		5 L	248,885
	24	248,800		161	248,817		101	248,833	D13—	17	248,850		27	248,867		5 MM	248,882
	25	248,801		182	248,816		114	248,834		18	248,851			248,868		5 SP	248,883
	66	248,802		207	248,818		159	248,835		24	248,852	D23—	149	248,869		5 SS	248,884
	91	248,803	D8—	11	248,819		167	248,836	D14—	3	248,853	D24—	10	248,870		15 AJ	248,886
	105	248,804		61	248,820	D10—	57	248,837		30	248,854		31	248,871		15 K	248,887
	136	248,805		107	248,821		60	248,838		39	248,856		64	248,872			248,888
		248,806		354	248,822			248,839		75	248,855		99	248,873		15 LL	248,889
	157	248,807		382	248,823		107	248,840	D15—	123	248,857	D25—	39	248,874	D87—	3 A	248,890
	169	248,808		387	248,824		113	248,841	D16—	06	248,858		62	248,875		3 F	248,891
	177	248,798		395	248,825	D11—	118	248,842		42	248,859	D27—	27	248,876			248,892
	188	248,809		499	248,826		127	248,843		62	248,860		36	248,877	D92—	1 K	248,893
	197	248,810	D9—	2	248,827		128	248,844		65	248,861	D28—	46	248,878	D96—	12 R	248,894
D7—	53	248,811		42	248,828	D12—	25	248,845	D19—	36	248,862	D30—	1	248,879			248,895
	77	248,812		44	248,829		156	248,846			248,863						

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36 : 248,811
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248,849
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248,872
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248,884
248,889
37 : 248,867
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39 : 248,798
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248,833
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40 : 248,894

42 : 248,802
47 : 248,805
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48 : 248,819
248,821
248,842
248,866
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